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LONDON, SATURDAY, SEPTEMBER 18, 1852.

REVIEWS.

The Life and Works of Robert Burns.
 Edited by Robert Chambers. Vol. IV.
 Edinburgh: Chambers.

"THERE is not, among all the martyrologies that ever were penned, so rueful a narrative as the lives of the poets." So wrote Robert Burns, in the year 1793, with the annals of which this volume commences. His own life was but too sad an instance of the truth of the remark. His history if melancholy is also instructive, and the readers of it if 'sadder' ought also to be 'wiser' men. Not much new matter of importance has Mr. Chambers added to the poet's biography, nothing, we mean, by which any estimate already formed of his personal history and character will be materially affected. But he has collected with diligent assiduity, and presented with judicious skill, all that has hitherto been ascertained as to the events of his life, adding not a few curious details which had escaped the notice of previous biographers. The plan of the work, moreover, is excellent, the Poems and Letters being given chronologically, with the Life as a connecting narrative. Enthusiastic admiration of the poet's genius, impartial appreciation of his character, strong national feeling, and intimate acquaintance with the scenes and customs of Scotland, conspired, with his literary experience and ability, to make Robert Chambers a fit biographer and editor of Burns. A fine imaginative essay on the poet's genius and works, like those of Professor Wilson or Mr. Carlyle, was not to be expected, but whatever intelligent labour, sound judgment, and hearty zeal could do, has been done in the preparation of this work. In some parts the style warms into unwonted animation, as in the following graphic sketch of the poet's daily life at Dumfries:—

"So existence flows on with Burns in this pleasant southern town. He has daily duties in stamping leather, gauging malt-vats, noting the manufacture of candles, and granting licences for the transport of spirits. These duties he performs with fidelity to the king and not too much rigour to the subject. As he goes about them in the forenoon, in his respectable suit of dark clothes, and with his little boy Robert perhaps holding by his hand, and conversing with him on his school exercises, he is beheld by the general public with respect, as a person in some authority, the head of a family, and also as a man of literary note; and people are heard addressing him deferentially as *Mr. Burns*—a form of his name which is still prevalent in Dumfries. At a leisure hour before dinner, he will call at some house where there is a piano—such as Mr. Newall, the writer's—and there have some young miss to touch over for him one or two of his favourite Scotch airs, such as the 'Sutor's Daughter,' in order that he may accommodate to it some stanzas that have been humming through his brain for the last few days. For another half hour, he will be seen standing at the head of some cross street, with two or three young fellows, bankers' clerks, or 'writer-chiels' commencing business, whom he is regaling with sallies of his bright but not always innocent wit—indulging there, indeed, in a strain of conversation so different from what had passed in the respectable elderly writer's mansion, that, though he were not the same man, it could not have been more different. Later in the day, he takes a solitary walk along the Dock Green by the river-side, or to Lincluden, and composes the most part of a new song; or he spends a couple of hours at his folding-down desk, between the fire and window in his parlour, transcribing in his bold

round hand the remarks which occur to him on Mr. Thomson's last letter, together with some of his own recently composed songs. As a possible variation upon this routine, he has been seen passing along the old bridge of Devorgilla Balliol, about three o'clock, with his sword-cane in his hand, and his black beard unusually well shaven, being on his way to dine with John Syme at Ryedale, where young Mr. Oswald of Auchincruive is to be of the party—or maybe in the opposite direction, to partake of the luxuries of John Bushby, at Tinwald Downs. But we presume a day when no such attraction invades. The evening is passing quietly at home, and pleasant-natured Jean has made herself neat, and come in at six o'clock to give him his tea—a meal he always takes. At this period, however, there is something remarkably exciting in the proceedings of the French army under Pichegru; or Fox, Adam, or Sheridan, is expected to make an onslaught upon the ministry in the House of Commons. The post comes into Dumfries at eight o'clock at night. There is always a group of gentlemen on the street, eager to hear the news. Burns saunters out to the High-street, and waits among the rest. The intelligence of the evening is very interesting. The Convention has decreed the annexation of the Netherlands—or the new treason-bill has passed the House of Lords, with only the feeble protest of Bedford, Derby, and Lauderdale. These things merit some discussion. The trades-lads go off to strong ale in the closes; the gentlemen slide in little groups into the King's Arms Hotel or the George. As for Burns, he will just have a single glass and a half-hour's chat beside John Hyslop's fire, and then go quietly home. So he is quickly absorbed in the little narrow close where that vintner maintains his state. There, however, one or two friends have already established themselves, all with precisely the same virtuous intent. They heartily greet the bard. Meg or John bustles about to give him his accustomed place, which no one ever disputes. And, somehow, the debate on the news of the evening leads on to other chat of an interesting kind. Then Burns becomes brilliant, and his friends give him the applause of their laughter. One jug succeeds another—mirth abounds—and it is not till Mrs. Hyslop has declared that they are going beyond all bounds, and she positively will not give them another drop of hot water, that our bard at length bethinks him of returning home, where Bonnie Jean has been lost in peaceful slumber for three hours, after vainly wondering 'what can be keeping Robert out so late the night.' Burns gets to bed a little excited and worn out, but not in a state to provoke much remark from his amiable partner, in whom nothing can abate the veneration with which she has all along regarded him. And though he beds at a latish hour, most likely he is up next morning between seven and eight, to hear little Robert his day's lesson in 'Caesar,' or if the season invites, to take a half-hour's stroll before breakfast along the favourite Dock Green."

One thing it is satisfactory to know from Mr. Chambers' researches, that the tales about the 'pinching poverty' of the bard have been greatly exaggerated, as well as the charges as to the neglect of his contemporaries:—

"The whole popular idea entertained of the pecuniary circumstances of Burns, and consequently of the manner in which he and his family subsisted in the latter part of his life, requires correction. The stated official income of Burns was 50*l.* a year, which usually became 70*l.*, in consequence of extra allowances for certain departments of business. It has been surmised that he had to keep a horse out of this little income; but in reality, when a horse was required during the Dumfries period of his life, he was accustomed to hire one from an inn, and its expense was charged to the service. There seem to have been other sources of official income, of a more precarious nature: on the back of a song in his handwriting, he has noted what follows: 'I owe Mr. Findlater 6*l.* 8*s.* 5½*d.* My share of last year's fine is 12*l.* 2*s.* 1*d.* W. M., 14*l.* 3*s.* 6*d.*'

If this was anything like the average of some other perquisite, it would make up Burns's official revenues to something above 80*l.* a year. It may also be remarked, that his son, Mr. Robert Burns, believes that the poet occasionally derived a little income from land-surveying—a business for which his Kirkoswald education had laid the foundation of his qualifications. Add to all this the solid perquisites which he derived from seizures of contraband spirits, tea, and other articles, which it was then the custom to divide among the officers, and we shall see that Burns could scarcely be considered as enjoying less than 90*l.* a year. This, indeed, is but a humble income in comparison with the deserts of the bard; yet it is equally certain, that many worthy families in the middle ranks of life in Scottish country towns were then supported in a decent manner upon no larger means; and very few men of the poet's original profession, out of East Lothian and Berwickshire, drew larger incomes from their farms."

In a chapter entitled the 'Posthumous History of Burns,' some facts are mentioned which confirm this statement. At the same time the highest sum at which his income is estimated was a poor pittance on which to support a household of seven or eight persons, even in Scotland. It affords noble proof of the honourable feeling and self-denying prudence of Burns, worthy of being noted by Mr. Jerdan in his discourses on the ethics of literature, that he left debts only to a trifling amount, and that the domestic expenses at Dumfries were greater after his death than when he himself controlled the household expenditure. Of the public subscription for the family, and the publication of the posthumous works for the same fund, Mr. Chambers has collected many details which will now be read with interest. It is stated, as the result of an examination of the papers of Dr. Currie, that 1400*l.* were realized for the widow and her family by the publication of the 'Life and Works' in 1800, a larger sum than is mentioned in the 'Memoirs of Dr. Currie,' by his son, Mr. W. Currie. The late Earl of Panmure settled a pension of 50*l.* a year on Mrs. Burns in 1817, but in a year and a half one of the sons, James Burns, was able "to relieve her from the necessity of being beholden to a stranger's generosity." The poet's eldest son, Robert, after having given promise, both at school and at Glasgow College, of great talent, obtained a situation in the London Stamp Office, the drudgery of which, added to his exertions by private teaching to supplement a small income, repressed all literary aspirations. He retired to Dumfries in 1833, where he still lives. The other brothers, James and William, rose to high rank in the East India Company's service.

"Mrs. Burns, through the liberality of her children, spent her latter years in comparative affluence, yet 'never changed nor wished to change her place.' In March 1834, at the age of sixty-eight, she closed her respectable life in the same room in which her husband had breathed his last thirty-eight years before."

The competition at the sale of the household furniture showed how high the admiration of Burns' memory had risen during the interval in the public mind. The articles sold for many times their intrinsic worth. "Of the linens, a table cloth, marked 1792, which, speaking commercially, might be worth half-a-crown or five shillings, was knocked down at 5*l.* 7*s.* The poet's eight-day clock, made by a Mauchline artist, attracted great attention from the circumstance that it had frequently been wound up by his own hand. In a few seconds it was bid up to 15*l.*, and was finally disposed of for 35*l.*" We must not omit to

mention that these posthumous notices include an elaborate craniological commentary by Mr. George Combe and Mr. Robert Cox of Edinburgh, on the examination of the cast of the poet's head, taken when he was re-interred in the Dumfries mausoleum, in 1834. This document will be read by phrenologists with complacent triumph, and with admiring curiosity by the general reader. In singular accordance with the poet's actual history, it is announced that "Philoprogenitiveness and Ideality are very large," and on the "full development of Acquisitiveness" Mr. Cox makes the profound observation, that "he was remarkably frugal, except when feelings stronger than acquisitiveness came into play, such as benevolence, adhesiveness, and love of approbation." No mental philosopher nor ordinary observer of character could have arrived at this result without knowledge of the organs, nor we suppose at the conclusion with which Mr. Combe sums up his phrenological review, when he says, that "if Burns had been placed from infancy in the higher ranks of life, liberally educated, and employed in pursuits corresponding to his powers, the inferior portion of his nature would have lost part of its energy, whilst his better qualities would have assumed a decided and permanent superiority." Had Burns, in other words, been in the station of Byron, he would have amazed the world as much by his virtues as by his genius! Mr. Chambers has the good sense to put this nonsense in a note in the appendix, and does not by any comments of his own endorse the phrenological report of his fellow-townsmen.

One passage we must give, which presents the biographer's general estimate both of the life and of the works of Burns:—

"On a narrow and critical examination of the life and conduct of our great poet, and thus getting quit of the almost mythic gloss which already invests it, we do not find either that garret-like poverty which is usually associated with his name, or that tendency to excessive or wild irregularity which has been imputed to him. Burns was cut short by an accidental disease in the midst of a life, humble indeed compared with his deserts, but one attended with no essential privations, not to any serious extent distressing to his spirit, and not un-hopeful. A very short time before his death, he is found looking cheerfully forward to promotion in the branch of public service to which he had attached himself; and it may be added, if he had lived a few years longer, and attained the expected promotion, his situation would have been one far from despicable. In his official conduct, Burns, it fully appears, displayed diligence and accuracy. He behaved himself much more like a man of the world than is generally supposed. The charges against him on the score of intemperance have been proved to be greatly exaggerated. He was only the occasional boon-companion, never the dram-drinker or the sot; and his aberrations in this line were those of the age, not his own. There remains, indeed, one serious frailty at the charge of Burns. It has been spoken of here with candour, lest, in the event of its being slurred over, an exaggerated idea of it should be entertained. It certainly was much to be deplored; and yet we must see that it was connected and inwrought with the peculiar poetical power which he possessed, a power of which, apparently, we should not have had the benefits on cheaper terms. We may pronounce, therefore, against the sin, and deplore the humiliation into which it brought so noble a genius; but we must at the same time remember, that the light which led astray was in him truly 'a light from heaven.' If Burns had lived ten years longer, we should have seen him surmounting the turbid wave of passion, and atoning for many of his errors. Let us give him the benefit of this ideal amendment.

"There, after all, was a defect in Burns which no number of years would have ever enabled him to remedy, and this was his want of a vigorous will. Thomas Carlyle, after writing most generously of Burns, has been carried so far in his ardent admiration as to say, that no other man was so well entitled to be at the head of the public affairs of his day, as if his being so peculiarly a man of talent fitted him above all rivalry for that eminent situation. There could not be a greater mistake, for how could a man, who was unable to exercise a control upon his own passions in the simplest things, have ever been able to exercise the control upon himself and others which is necessary in the great statesman? The general abilities of Burns were no doubt extraordinary; but it is perfectly clear, that the poetical temperament ruled in his nature. He was impressionable, irritable, capricious. Whatever he did that was brilliant, he did under impulse. He only reflected when it was too late. Minds like his have their own mission; but it is not to sway great democracies. It is to touch the souls of men with their fine sensibilities, and give an imperishable voice to the subtlest emotions of their bosoms. In studying such minds, we are not to expect calm and regulated movement, as of some machine perfect in all its parts, and which has certain definite purposes to serve. It is not of that active character at all. We are rather to look for some passive thing like the Æolian harp, which has a hundred moods in an hour. Such, truly, is the poet; and it must ever be a fearful problem, how such a being is to stand towards the rest of society, how he is to get his living, and how he is to observe one-half of the sober maxims of conventional life.

"As a poet, Burns is not of course to be ranked with any of the higher denominations. He competes not with the Homers or the Miltons; scarcely even with the Drydens or Popes. But he stands in a very noble rank by himself, as one who treated with unapproached felicity all the sensuous familiar things which lay around him in the world. It may be said, that he is happy in the treating of these things in a great measure by reason of his singular command of language. Whatever idea was within him, there was a channel of expression for it, by which it came out in full and true lineaments, and without a single sacrifice to rant, or trick, or the exigencies of verse. The possession of this language-power, Horatian as it was, would have never of itself made a great poet; but it, and the fruitful mind together, conferred an advantage which there was no resisting. When we seek to ascertain what it is in the thoughts and feelings of Burns which pleases us so much, we find that it mainly is their unaffected simplicity and naïveté. He was the true man before he was the true poet. To be so entirely free of a tedious literalness, he is the most faithful of painters. The emotions of a liberal genial nature flow from him, and we all feel that it is a voice which admirably represents his kind. There is never any pause for an expletive ornament. Art is completely concealed in his case, simply because he wrote the ideas as they naturally rose and came, and not with any secondary view to effect. Thus he is the least egotistic of poets, for even where he worships some female divinity of his own, he does it in the words which all would feel to be suitable in the like circumstances. It is alike in humour and in the serious or sentimental. Never does Burns fail to be true, simple, and direct, and rarely, accordingly, do his verses fail to paint themselves upon the imagination of the reader. I must, after all, hesitate about the place which ought to be assigned to him among the British poets. Since his own day, he has advanced immensely in consideration; and perhaps he is only now as Shakspeare was in the time of Dryden and Rowe. What the British opinion may ultimately decide about one who drew so faithfully and sang so sweetly, it might be rash to vaticinate."

The verdict of 'the British public' is already much the same as that which Pitt uttered at Lord Liverpool's table, soon after the poet's death, "I can think of no verse since Shakspeare's that has so much the ap-

pearance of coming sweetly from nature." It is not pleasant to have to add, that Addington once urged Pitt to do something for Burns during his lifetime, but "Pitt pushed the bottle to Lord Melville, and did nothing."

Now that Mr. Chambers has completed his work we have pleasure in repeating the satisfaction expressed by us on the appearance of the first volume ('L. G.' 1851, p. 71). He has performed his part both of biographer and editor in a manner such as has justified the anticipations formed from his general ability, and from his peculiar qualifications. We have little doubt that this will henceforth be the standard edition, certainly the most popular edition, of the works of Burns.

Leaves from my Journal during the Summer of 1851. By a Member of the late Parliament. Murray.

WE have here the journal of a water-drinking ex-member of parliament during a tour from London to Carlsbad and back again. It is written in a somewhat egotistical strain, part quaint, and part silly, but is nevertheless truthful and amusing. The author describes himself to be of "a vacillating disposition," with "aristocratic nerves," and possessed of "the bump of locality so strongly that once having visited a place" he feels he knows it "almost intuitively in all its bearings." The ex-member is fond of punning, and speaks of the Royal Exchange, in comparison with a building for similar purposes on the Continent, as a Tite-an structure; he moreover strains at considerable humour in the relating of such events as being late for a train, the difficulties of exchanging English money, the price of a hackney fare, and the thousand and one trivialities that beset the path of the freshman on the Continent. As an example of his pencillings by the rail, we may quote an anecdote of a bridal pair on their way to Leipzig:—

"Thus we went on to the second station, where the bridegroom got out, with an air of affectionate solicitude, as I supposed, to get a bouquet for the cynosure of his eyes;—but my pen almost refuses to narrate the sequel. In the twinkling of an eye, with a joyous countenance, he returned to the girl of his heart, with a Butterbrod adorned with caviar and sausage. For a moment I felt convinced she would scornfully reject the proffered indignity; but, alas! the truth must be spoken—the pledge of affection was accepted with gratitude, inspected with the eager glance of desire, and the open mouth of appetite: I saw no more, but sunk down in my corner with averted eyes and a broken heart."

On the public walks of Leipzig the author has some sensible remarks:—

"The walk round the walls—or how shall I express it, for walls there are none!—but the walks upon the demolished fortifications of Leipzig, now a well-shaded pleasure ground of l'Anglaise, are amongst the most pleasing of these places of urban recreation (and there are many) with which I am acquainted in Germany. I recollected it well, and returned to it with unfeigned satisfaction, tempered, however, with the feeling of sincere regret, that we have nothing of the sort for our middling and poor folk in England. The value of such a thing, for such a town, is not to be calculated; and the workman, with such a healthful advantage, must, even in bad circumstances, find less temptation to repine at the lot of his more fortunate neighbour, with his park and pleasure-grounds. In some portion, besides, he is sure to find a little stall or guinguette, with a sunny or shady seat, as the case may be, offering some humble but grateful luxuries for his enjoyment. What would I not give to see my own country's children of toil so

furnished! That I had not contented myself with wishing only for these things for them, suggested a complacent reflection; but when I saw the people of Leipzig in their holiday attire, who have only a step to go to find themselves in this little Elysium, and then transported myself back in thought, *per mare per terras*, and saw the access to the Thames on both sides absolutely forbidden, and thought of the long walk that must in most instances be taken to gain even such bare recreation as our parks afford, the contrast was annoying."

The eclipse of the sun last year took place as our author was passing through Zwickau, and great was the use of it made by some of the Romanists:—

"That a fraud was attempted on the peasants, in a parish very near Carlsbad, by certain priests, I know from most unimpeachable testimony; but I am not aware that the government had any share in the proceeding. They said it was revealed to them, that the Almighty had determined to destroy the world, and that, although the Blessed Virgin had interceded, her mediation had not then been accepted, because the people had countenanced liberal opinions, and had not been obedient to the Emperor,—that, on the 28th, a great sign would appear on the sun,—and that, unless they abstained from work and came to church, and promised to do better, the light of the sun would certainly be extinguished. This the peasants made known to a very energetic proprietor, in the parish, who employs many hands in various ways, as an excuse for their not appearing at work on the 28th. His indignation knew no bounds, and seizing his hat in one hand, and cap in another, he placed them both in the line of sight, and asked them if they could see both? Upon their replying in the negative, he added, 'Suppose the moon should come between the earth and the sun, could you see both?' 'No,' said they. 'Well, my friends, that is all that will happen on Monday.' Accordingly, they returned quietly to their work with him as usual; and, of course, as the necessary consequence of all such pious frauds, the blame was laid upon the religion, and not on the system: thus faith is shaken, and the very foundations of order and morality sapped."

We must, however, pass on to Carlsbad:—

"I got up at five o'clock on Tuesday morning, and commenced drinking from my old fountain, the Theresien Brunn. There appeared to me to be an immense number of people, compared with my former recollections, and some changes in the personal appearance of two important springs had taken place. The Schloss Brunn had had an accident. In order to keep the Sprudel in full play, they are obliged to make borings periodically, in order to prevent the passage from beneath being choked up by the rapid formations of the incrustation known by the name of the Sprudelstein. This operation was performed, as usual, last year, when all of a sudden the Schloss Brunn disappeared. As this source is remarkably popular with the natives, who constantly resort to it, being the coolest water, having an agreeable taste and supposed efficacy in many minor ailments, great was their discomfiture when the intelligence was made known, and great their joy when, upon breaking into the rock a little deeper, the fountain of health was again discovered, with only a trifling loss of temperature, which, however, as it contained an increased amount of carbonic acid gas, had a still more acceptable flavour. But what surprised me most was, that both this source and the Mühl Brunn, which has always been extremely *à-la-mode*, and is now in the zenith of its popularity, were surrounded with barricades, open, indeed, at each end, but admitting of approach only by single file. Upon inquiring the reason of this unusual appearance, I was informed that the crowding round these wells of water had been so great at the commencement of this season, that it required the strength and gallantry of a Mæus to enable the weaker sex to obtain a supply of the precious fluid; and broken cups and torn dresses attested the vehemence of the assault upon this pool of Bethesda. In vain they rose at half-past three in the morning: long before the magical

eight goblet could be quaffed, the siege had recommenced, and the most happily-inaugurated cures threatened to end only in aggravation of the malady;—a mind free from care being an indispensable requisite, whereas, owing to corroding anxieties about the events of the morrow, which these circumstances engendered, calmness and tranquillity had fled. Certainly here was a *dignus vindice nodus*; and happily a liberator appeared in the shape of Mr. Seppings, a gentleman connected with our Indian navy, who, having observed the unnecessary confusion, suggested to, and obtained from, the authorities the remedy which I have described, and which at once appeased the storm and checked the growing evil. The scene, however, was droll enough when first I saw it: the double file extended some hundred feet beyond the wooden barriers; two policemen were stationed to see that no one cut in; one file passed on one side the source, and one on the other; four nymphs were incessantly employed in receiving the goblets and filling them, and administered, by my stop watch, upon the average, from 900 to 1000 goblets per hour, from half-past four to eight o'clock. As, however, a quarter of an hour only must elapse between each potation, when the strain was the greatest the drinkers formed an endless chain—those who had drunk being compelled to march back, and replace themselves at the end of the tail, in order to arrive at the source again at the proper moment, really working hard for health. * * *

"There can be no doubt that the plainer you live whilst under the influence of this powerful water the better; and the more we islanders can bend our stubborn selves into conformity to the hours here, the better shall we be able to get on afterwards with our own. Get up at half-past five at latest; make the indispensable commencement of an Englishman's toilet; wrap yourself up warm; dispose of your eight glasses, more or less, between six and eight; don't force yourself to drink more than you comfortably can—nature will direct you; dawdle about, or walk for half-an-hour before you come home after the last glass; then return home and finish dressing."

Here is an amusing account of the bread of the water-drinking city:—

"The varieties of the staff of life are here endless, though they certainly appear in a somewhat fragile shape, and if any one were to lean upon the so-called stange or bar of bread for support, it would treat him very much after the fashion of Pharaoh King of Egypt. There are endless diminutive appellations of endearment given to these little idols. The following are, however, the principal designations: first, the Semeln, which is the common round roll, and which is either quite plain, or has in it a little milk. Those who like to have a reason for a name will be gratified to learn that it is so called from the Latin *semel*, once baked; in contradistinction to the Bis-cotto or Zwieback (the rusk or biscuit), twice baked. Next comes the Kipfl, or Hörnl, so designated from its crescent shape, which is nearly as universal in Germany as the Semeln, and is the invariable native accompaniment of the morning's coffee. Then the Stange, which is a very crisp finger, about a foot long, and has a little butter added to the flour and milk. Following in the wake of this, but a step nearer pastry, is the Stritzel; it is extremely good, but, unlike the Stange, twisted in the shape of a true lover's knot. Then the Zwieback, before described, of which the most *recherché* is that made at Presburg, which has a European reputation, cannot be made elsewhere, and is to be found in all distinguished watering places. It is a rusk encrusted with a mixture of almonds and sugar, very light; they dip it here in their chocolate and coffee, and esteem it a great delicacy; it is to be found, *chez nous*, in that great exhibition of all nations, called Fortnum and Mason's; but it is somewhat too sweet for the generality of British palates. The Oblaten are, however, the pride of Carlsbad; they are attractive-looking wafers, or rather double wafers, quite flat, about five inches in diameter, impressed with a mediæval pattern,

and inclosing sugar, crisp and crackling, with a slight taste of vanilla; they are not usually eaten till after dinner."

With one suggestive extract touching the music of Carlsbad we must take our leave:—

"The Bohemian harp is a most unsophisticated instrument, made at a village called Preisnitz, not far off, for about two guineas; it has six octaves, and the semitones are produced by the pressure of a little brass hook which turns on a screw in the top. Two of these harps, with a guitar, flute, and violin, more or less, compose the usual tea-garden bands; and so correct is the national ear in this land of harmony, that you will rarely hear a note out of tune, even if it does not give you an inclination to dance, greater or less, according to your age and nerves. There is no rose without its thorns; and as the windows are all open, and music the rage, hopeless attempts to conquer Thalberg's newest fantasia, and to rise to the heights of 'Robert! Robert! grâce pour toi et moi,' induce one occasionally devoutly to join in that lofty aspiration. I was myself rather unfortunately situated in one respect, being directly opposite the theatre; for though the stream was between us, the roof of the playhouse was of so slight a material that the rehearsals of the operas (not quite of the best when the evening came) at times sent forth strains resembling a discordant shout, the seven male and seven female choristers having failed in a sensation chorus. The opera, however, is really not so *very* bad as might be expected; assisted by Labitsky's orchestra; and the comedy is very respectably given. The singers and actors have, besides, this great and evident merit—the having learned to live upon air. The pit costs tenpence, the stalls sixpence, the boxes three shillings and sixpence, and the theatre is never more than half full; still it continues during the season, beginning at five and terminating at eight, and, strange to say, the corps does not die of starvation."

As a private journal for the amusement and interest of a family circle, this narrative of an every-day tour on the Continent is not unworthy of perusal; but to speak impartially of it as a contribution to public reading, we think the author's powers are scarcely equal to the beautiful paper on which they have been good-humouredly impressed.

Women of Christianity, exemplary for Acts of Piety and Charity. By Julia Kavanagh. With portraits. Smith, Elder & Co.

Miss Kavanagh's work, which, until lately, we had accidentally mislaid, embraces a wide field of female achievement. Beginning with Dorcas, and ending with Sarah Martin, the prison missionary of our own times, she sets before us the heroic deeds of the intermediate saints and martyrs; deeds they were for the most part of peaceful heroism, calling for a stern moral courage far superior to the physical bravery which has turned delicate women into warriors and soldiers. These women were the "faithful soldiers and servants" of the church, under whose banner they were enabled to conquer the evil things of this world, and to win for themselves an imperishable crown of victory. To some the crown of martyrdom was literally added, and they sealed their faith with their blood, dying, as they had lived, with the fortitude of heroes and the humility of saints: all figuratively 'died daily,' and but for the hope that was in them, death might have been preferable to the persecutions and privations which, in the early days of the Church, attended all who clung to her.

In spite of a subject apparently interesting, and a style easy and pleasant, there is great

monotony in the biographical sketches before us, and while the characters of the noble women they portray call forth unfeigned admiration, the details are infinitely tedious. We are inclined to think the monotony unavoidable. The authoress herself complains of the "painful and wearisome similarity" of the materials at hand, and conceives that this similarity ought not to have been, as "the good are not alike, but differ from one another as much as other people." In individual traits no doubt they do, but not in the broader characteristics which are likely to come under the notice of the biographer. In sin there is endless variety—in goodness inevitable sameness. We have but one example of perfect goodness, and in attempting to attain the like excellence we must follow in the same path. Touches of personal character seldom reach us from the remote period of which great part of this work treats, and thus one of Miss Kavanagh's heroines greatly resembles another. We must, however, give to our readers some extracts from the most interesting portions of the narrative.

The career of St. Elizabeth of Hungary is long dwelt upon, and is peculiarly touching. Mistress of a court, beautiful in person as in mind, united to a husband whose love for her was unbounded save by his love for heaven. Elizabeth evinced a meekness, and exercised a self-denial rarely to be found in such an atmosphere. Her charity was excessive, and of the most active kind. She went herself on her errands of mercy, tended lepers, watched by the dying, performed the last offices for the dead, and comforted the survivors. In the great dearth of 1226, her husband being absent, Elizabeth hesitated not to distribute the contents of the treasury among the starving people. On the return of Lewis, she told him—"I gave to God what belonged to him, and God kept us what was thine and mine." No sacrifice was too great to be offered up to conscience, and while we bestow all admiration on the zeal by which she was animated, it is impossible not to feel how mistaken was the course to which it sometimes impelled her.

"The expenses of the landgrave's table were defrayed by certain taxes which Lewis either thought just, or could not remove. The confessor of his wife, Conrad of Marburg, an austere domineering priest, to whom, however, cannot be denied the merit of ever seeking to defend the oppressed, declared that this tax ground down the poor, and forbade his penitent to taste the food thus procured. Elizabeth obeyed, but as, of all the dishes on her husband's table, there were only a few which she could touch, and as she did not wish to seem to make a difference, she was often starving in the midst of plenty. Once being on the point of accompanying the landgrave on a journey, she could find nothing to eat save a piece of brown bread, so hard that it had to be soaked in warm water. That same day she rode sixteen leagues on horseback."

None of these privations were looked upon in the light of trials by Elizabeth; she rather welcomed them as opportunities of testifying her fervent love and piety. But trial, under which even she bowed down, came at length in the death of her husband. In the passionate and uncontrolled grief which seized her then, we read the weakness of human nature, from which she had hitherto seemed almost exempt. Love was the strongest feature in her character, the mainspring of all her actions. She might have answered with St. Teresa of Avila, who, being questioned concerning the torments of the damned,

thought it sufficient to reply simply—"They do not love."

The family of Elizabeth of Hungary afforded, during many succeeding years, noble examples of female piety and heroism. It was of Hedwige, Queen of Poland, one of her descendants, that the following anecdote is recorded:—Some poor peasants came to her in tears, complaining that the servants of the king had carried off their cattle. Hedwige went to her husband, and obtained instant redress, but feelingly exclaimed—"Their cattle have been restored to them, but who can give them back their tears?"

The feminine gentleness which dictated the answer cited above of St. Teresa of Avila was accompanied by a masculine intellect. Her name is but little known among us; on the Continent it has for three centuries commanded popular veneration. Bossuet, Fleury, and eminent men of modern France, have paid tribute to the power of her genius. The original manuscripts of her works were kept carefully locked in the royal palace of the Escorial, while a proud Spanish monarch carried the key on his person. Their peculiar tone of mysticism and romance renders them distasteful and incomprehensible to the majority of modern readers, and they are now seldom perused. It is, however, less to her literary achievements than to her strenuous efforts to reform the Carmelite order that she owes her renown. She devoted great part of her life to effect this reformation of the order to which she belonged, and was eminently successful. At her death, at the age of sixty-seven, she left sixteen convents of nuns, and fourteen of friars, all obeying her rule, and most of them founded by her.

In spite of the impiety and immorality which characterized France in the seventeenth century, we find at this time instances of individual Christian virtues which shine all the more brightly from the darkness which surrounded them. Madame de Chantal, an ancestress of Madame de Sévigné, was among the most conspicuous for zeal and charity. Her zeal often led her into acts of exaggerated devotion. The Baron de Chantal lost his life through an accident when she was but twenty-eight. She loved him devotedly, and being urged by her friends to contract a second marriage, not only refused, but in a fit of religious enthusiasm branded the name of Jesus on her side over her heart with a red-hot iron. The moderation and prudence of Francis de Sales, with whom she was on terms of the closest friendship, often acted as a salutary check on this excessive and injudicious fervour. "Our devotion," he told her, in allusion to the discomfort some of her habits of piety produced in her household, "should never be inconvenient to others." But though zeal thus sometimes overstepped judgment, her faith was essentially practical. A friend having written her a long account of the graces bestowed on her by Heaven, Madame de Chantal wrote back simply, "You have sent me the leaves of the tree, send me likewise of its fruit, that I may judge of it."

Miss Kavanagh gives a detailed and very interesting account of the labours of St. Vincent of Paul, and their results. Under his direction commenced that order, which now, known by the name of *Sœurs de Charité*, has spread itself far and wide, not only through the country which witnessed its birth, but through great part of the world. Its origin was simple:—

"While St. Vincent was at Chatillon, in Bresse, in the year 1617, a lady requested him to recommend to the charity of his congregation a poor family lying ill in a farm without the town. He did so, but the effect surpassed his desires. He perceived that the sick family had received too much at once, and would probably fall back into their former state ere long; when, pity being exhausted, no one would care for them. This inconvenience, which always attends ill-regulated charity, induced him to establish a sisterhood of prudent and charitable ladies, willing to devote a portion of their time and subsistence to the task of visiting and relieving the poor. He found many such, and drew up a few simple regulations for their use."

He met with an able assistant in Madame Legras, a wealthy widow, to whom he stood in the position of confessor, and whose whole life was devoted to the service of the poor. Every summer she visited the sisterhoods throughout France, exhorting their members, increasing their numbers by her influence, and teaching them their duties by her example. Many difficulties were encountered, but they were met with cheerful alacrity and fervent piety, and were thus overcome.

St. Vincent had not, in the first instance, thought of establishing a religious order, but it having grown up, as it were, spontaneously from this small beginning, he became anxious to place it on a sure foundation. Mademoiselle Legras and her disciples took the vows, and in the following century Paris alone had no less than thirty-four establishments for the Sisters of Charity.

"The regulations which St. Vincent drew up for their conduct breathe the most admirable spirit, and are fraught with prudence and wisdom. The Sisters of Charity take the vows of chastity, obedience, and poverty, after a probation of five years; but their vows are for one year only, so that they may always possess the merit of liberty. They renew them every year on the 25th of March, this being the anniversary of the day when Mademoiselle Legras first took hers. They cannot do so without the permission of their superior; who sometimes inflicts delay as the severest punishment in her power. Few sisters have ever sought or wished to re-enter the world; and though exposed to all its temptations, no cloistered nuns surpass them in the exact and faithful observance of the rules of their order.

"Neither the fasts, vigils, nor other austerities of the cloister, were prescribed to the Sisters of Charity. To rise, winter and summer, at four in the morning, to pray twice a day, live with the greatest frugality, drink wine in illness only, attend on the sick even in their most disgusting and painful illnesses, watch the whole night long by the bed of the dying, think it nothing to be immured within the walls of a hospital, and breathe air tainted by disease; to shrink not from sickness, fatigue, danger, or death: these and these only are the mortifications which he prescribed to the Sisters of Charity."

But it is the cause of the foundlings that has so familiarized and endeared the name of St. Vincent of Paul in France. The fate of these unfortunates had hitherto been almost incredibly sad. Daily were some found exposed in the streets and at church-doors. They were removed by order of the police to the house of a widow, residing in the Rue St. Landry, who, with the aid of two servants, had undertaken to rear them. Miss Kavanagh tells us—

"She was badly paid, and by far the larger number of her little charges pined away and died of want. Tired of their cries, the servants frequently silenced them with perfidious cordials that led to a lethargic slumber ending in death; those who survived were given away to whosoever cared to have them, and not unfrequently sold for a few

coins. Some took and bought them from mere pity; but it was not always so,—many, we are told, were purchased to suck the milk of diseased women, thus finding death in the very source of life; some to be substituted for children of rank who had died inopportunely; others, unhappy victims of a cruel superstition, were murdered to forward magical operations, or to give their blood to those unnatural baths in which old age sought to renew the freshness and vigour of youth."

Vincent prevailed on some ladies, already associated together for benevolent purposes, to visit the house of the widow. Horror-struck by what they saw, they took twelve of the wretched children, chosen by lot, and undertook to rear them. By degrees, as their means increased, others were received; but the number was necessarily limited till the year 1640, when the Queen Regent obtained from the King an annual grant of twelve thousand francs. Still the Association had well nigh fallen to the ground from want of means; but the zeal and energy of St. Vincent, the tender womanly sympathies combined with the extensive liberality of his spiritual daughters, finally triumphed, and two asylums were opened in Paris for the reception of those foundlings whose home had once been the widow's house.

By women also was proposed the still greater and more expensive undertaking of a general hospital for the mendicant poor of Paris, and by their energy the project was carried through, and a hospital, which still exists, was opened to five thousand beggars on the 7th of March, 1657, thus banishing mendicancy from the streets of Paris.

Space will not permit us to follow Miss Kavanagh into more recent periods and into our own country, which has, however, as the perusal of her pages will teach us, yielded its full share of women, who, if less conspicuous, are not less truly adorned with Christian virtues than those whose deeds we have cited. To those pages we would refer our readers, promising them pleasure and instruction in the contemplation of unaffected piety and zealous charity afforded by them.

Agreeing with Miss Kavanagh in a great measure in her sentiments regarding female heroism, we are not disposed to join in the slightly depreciatory tone with which she touches on "women whose virtues went not beyond the circle of home, and whose piety was limited by worship. Love and adoration," she continues, "are beautiful, but sacrifice is the true spirit of Christianity." Most assuredly it is the inseparable companion of Christianity, but where are they more closely united than in the very sphere which Miss Kavanagh seems to consider includes only the listless followers of a "faith without works"? We are not now called upon to choose between death and our religion—blows, stonings, prisons. The arena no longer awaits those who refuse to follow strange gods—yet are we not without temptations as trying to the spirit. Sacrifices, unknown beyond the heart that makes them, are the daily offering of the Christian now as then, and this without the excitement of publicity and physical exertion. Great and startling acts are more easily performed than small and unseen duties, and he who would not hesitate to "do some great thing," shrinks from the simple command "Wash, and be clean." We would not detract from merits of a more open description; we would only contend that trials as formidable as those enumerated in this volume, though of a different nature, meet the Christian women of our own

times, and are combated with a quiet, earnest piety as precious as the more active and visible energy of which we here read.

Delusion; or the Triumph of Virtue. A Poem in Four Cantos. By an Unknown Author. Saunders and Otley.

THIS poem bears on the title-page that it was "found on one of the Greek islands by a sailor." The preface further announces that the original papers were sold to a gentleman in London, who presented them to the author, —who thus, in a commonplace and rather silly way, intimates the Byronic style of his work. Some who were taken in by the Byron and Shelley letter forgeries, may also believe this to be truly a lost poem of the noble author—perhaps part of the batch of missing manuscripts concerning which, on the publisher complaining of their non-arrival, Lord Byron wrote—

"My dear Mr. Murray,
You're in a ——— hurry,
To set up this ultimate canto;
But (if they don't rob us)
You'll see Mr. Hobhouse
Will bring it safe in his portmanteau."

A mere passing allusion to Byron, such as the note on the title-page, would have been allowable; but the author grossly blunders when he proceeds, in his preface, to go into such details as to say, "the work appears to be an autobiography of a man of fortune, moving in the first circles and raised to the highest ranks of literature, suddenly dashed from his exalted position by his own imprudence. He was evidently a man of powerful genius, high intellectual attainments, independent mind, strong passions, great originality and versatility of talent, keen sarcastic powers, caustic and playful wit, much knowledge of the heart of man, and great classical research." This may be all very true as applied to Byron, but is sad twaddle in the use the author makes of it as descriptive of the present work. The prefatory criticisms are also absurdly overdrawn, although so far useful as pointing out what the writer considers his highest efforts. Introductions, and prefaces, and other appendages of works, often need to be subjected to critical censure as much as more important matter, and we therefore offer these remarks before giving judgment on the poetry of this 'unknown author.'

The poem presents a great variety of metre. Heroic couplets constitute the main bulk of the narrative part, while songs, ballads, odes, and other metrical interludes, freely occur. Without attempting to give any formal account of the subjects of the poem, we select a few passages which will afford a fair idea of the author's powers.

"Oh, could I wing to some fair spot,
Forgetting all, by all forgot,
Far from life's busy scene, alone
With thee, on earth that only one,
Who from its false mistaken charms
Would fly with me, and in my arms
Rest the long night; and through the day,
O'er the hills and dales away,
Would fondly ramble by my side,
A fair, a blest, delighted bride;
O'er rocky Switzer's bold retreat,
Where skies, and lakes, and mountains meet;
Within some deep sequester'd dell,
In low-roof'd cot content to dwell,
Where all is wild, and all is sweet,
Where, spread beneath our wand'ring feet,
The summer dew like pearls reposes
On clust'ring beds of blushing roses;
Where the woods and valleys glow,
Though Winter, with eternal snow,
Freezes on the cloud-topp'd hill,
'Midst howling tempests drear and chill;
Where the rifted glaciers rise,
Alp piled on Alp above the skies;

Though the silent traveller dreads
The threat'ning avalanche, and treads
With caution mute, lest every breath
Should hurl upon him instant death:
We'd chase the chamois, swiftly bounding
O'er the icy cliffs surrounding,
And when the slant beams of the sun
Warn us that the day is done—
When o'er each white peak's dazzling head
The ruby's crimson tints are spread,
As though they blush'd lest man should dare
Sleep ere he utter'd praise and pray'r,
Close to our faggot, blazing bright,
We'd nestle with unfeign'd delight:
Our sacrifice of thanks should rise,
Like holy incense, to the skies;
Then, fondly to each other press'd,
In sweet dependence sink to rest;
And driving winds, and pealing rain
Should beat against our roof in vain."

In the next extract the poet is alone.

"Ah, me! friends, fortune, reputation gone,
I wander'd through life's wilderness alone.
For I had driv'n my fond one from my arms—
The monster, grief, had revell'd on thy charms.
Away, remembrance! from my sear'd brain fly—
I left thee, Linda, in despair to sigh;
And retributive (!) justice quickly pour'd
Its vial on the wretch condemn'd, abhorr'd:
Hate's deadly curse, the blighting curse of hell,
Fell on his heart, and wither'd where it fell."

I stood alone amid that lofty mass,
For earthly home too high, for heav'n too low;
My soul aspiring, my weak flesh, alas,
Link'd with its kindred in this vale of woe;
Toss'd by the furious tide of passions to and fro.
Then soar'd my thought up to the liquid sky,
And pondered on those planets high and bright,
That take their march in silent majesty,
And scatter o'er its concave wondrous light,
Making night glorious.—And methought, shall we,
When from this strange mysterious world set free,
Leave to this whirling ball our rotting load,
And in some brighter sphere make blest abode?
Or into other earthly atoms pass,
As shades reflected from th' embodying glass,
That takes all shapes and hues? If such we be,
Then life and death are but a mockery."

The liveliest and most entertaining part of the poem describes an ideal Feast of Pan-nassus, and the doings and sayings of the poetic shades. Some of the songs and odes put in the mouth of the different guests are good imitations. The song of Horace thus begins:—

"You tell me, Lydia, time has roll'd .
Full fifty winters o'er my brow;
And 'midst the clust'ring locks of gold
Shower'd with rude hand his fleecy snow.
'Tis true, my girl, too true, alas!
Yet deep beneath th' eternal snow
Of hoar Imaus' frozen mass,
Live volcan fires that rage and glow.
The pow'r that bids May-blossoms shoot,
And scatters fragrance from above,
Calls verdure from the tough old root—
That pow'r, my charming girl, is love."

Others are less successful, and the whole canto too much recalls the happy idea of the 'Rejected Addresses,' compared with which any systematic attempt at imitations of the poets is likely to prove a failure.

It is only at the close of the fourth canto that the reader sees any meaning in its secondary title, 'The Triumph of Virtue.' After the delusive dream of life is over, a still small voice is heard whispering of the future:—

"Art thou not yet convinced, proud child of fame?
What hast thou sought on earth? A deathless name—
A shade, a phantom. Has thy ardent breast,
From youth to manhood, known one hour of rest?
Thy life a dream. In woman's love alone,
And Fame's vain toils, thy wasted years have flown.
Hast thou one friend? In stranger lands to roam
Thou'rt destined—there thy bed of rest—thy home.
Arouse thee from this lethargy—awake!
The idle spells of cheating Fancy break!
Disdain these bonds—thy noble nature scan—
Dare to be what Creation form'd thee—Man."

In this strain closes a poem, which as a whole is crude in its materials and faulty in its construction, but containing passages of force and beauty which satisfy us that the author might with taste and study produce something worthy of higher praise.

NOTICES.

Tennemann's Manual of the History of Philosophy. Translated by the Rev. A. Johnson, M.A. Revised, enlarged, and continued by J. R. Morell, H. G. Bohn.

TENNEMANN'S 'History of Philosophy' has now long been a standard book in mental science, and is not likely soon to be superseded. In France, it was introduced to general use by the translation of M. Cousin. In England, Mr. Johnson's version appeared at Oxford in 1832. Since that time a new edition of the original work has been published at Leipzig, in which the editor, Professor Wendt, added much important matter. Mr. Morell has incorporated these in Johnson's translation, giving besides an account of other developments of mental science both at home and abroad. The German speculations of Schopenhauer and Plancke on the will, and the doctrines of the new Hegelian school, as carried to extremes by Strauss and Feuerbach, are briefly but clearly stated. Of Swedenborg's tenets and works notice is taken, although omitted in the original work. The French school of speculative socialism, originating with Fourier, and advocated by Leroux, Comte, and others, obtain place in the summary. American contributions to Philosophy are not overlooked. Chapters are also added on Phrenology and Animal Magnetism. The volume thus contains a complete outline of the history of Philosophy, or rather of speculations on mental science, from the earliest periods of Oriental and Greek literature down to our own day. We must add, that a large part of the volume treats of subjects more curious than useful, and savouring too much of "philosophy falsely so called." Of the inductive and experimental study of mental science, in which Reid, Stewart, and the Scotch school distinguished themselves, very slight notice is taken, while a large part of the book relates to the Kantian philosophy, of which Tennemann was a disciple. Whether truly reported or not, there is much point in the saying ascribed to Kant on his death-bed, that "only one man ever understood his philosophy—that was Hegel, and he understood it wrong." But it is necessary, according to the present system of metaphysical teaching, to know the history of all past theories of mental philosophy, of the chief of which theories in every age and country Tennemann's 'Manual' gives a summary. Mr. Morell has ably fulfilled his part of editor.

Pastoral Theology. The Theory of a Gospel Ministry. By A. Vinet, Professor of Theology at Lausanne. Edinburgh: T. and T. Clark.

IN the best Protestant schools of theology attention is given to the practical training of students for the ministry, as well as to their instruction in the literature and science of their profession. Lectureships on Pastoral Theology, in which the rules and principles for the right fulfilment of the actual duties of the ministerial office are described and illustrated, have been established in connexion with the chairs of dogmatic, critical, and historical divinity. The miserably deficient state of all theological training in our own English universities, where fit preparation for sacred functions is left almost entirely to personal impulse and accidental advantages, prevent our possessing such chairs and the literature connected with them. To such old treatises as Bishop Burnet's 'Pastoral Care,' and Richard Baxter's 'Reformed Pastor,' any young clergyman best resorts who seeks guidance in entering on the practical duties of his office. Those, of course, who take their ministerial work as a matter of outward routine, without knowledge or concern about the spiritual duties and responsibilities of the office, need little direction beyond the ordinary rules and rubrics of the Established Church. But where higher feelings animate a pastor, there are few works from which he may derive information and counsel as to the practice of his sacred profession. Burnet and Baxter are good as to the spirit in which pastoral work should be undertaken, but do not go into many details for practical guidance. Other works which profess to be more practical are to be little commended for the spirit which pervades them. Bridge's 'Chris-

tian Ministry' is almost the only book occurring to us at the moment as an exception. For mere ecclesiastical influence and the application of worldly wisdom to the affairs of the ministry, the literature of the Romish church, and most of all the writings of the Jesuits, may be advantageously studied. But pastoral theology, in its protestant and evangelical sense, seeks the higher spiritual end, of how those devoted to the ministry may best promote the glory of God and the good of men. The biographies of good and successful preachers and pastors are full of the richest instruction on this matter. But it is well to present to students a more systematic statement derived from scripture, history, and experience. This is done in the present work of Professor Vinet, which though with the disadvantage of being prepared only from the rough manuscripts of his lectures delivered at Lausanne, not left by the author ready for the press, yet presents by far the most complete and most practical treatise hitherto written on the subject. After an introductory statement of the author's views as to the Christian ministry, he treats:—1. Of the pastor's individual and interior life; 2. Of his relative and social life, including personal character and domestic arrangements; 3. The pastoral life, including the public duties of the office, and the cure of souls or pastoral oversight; 4. The official or administrative life. On all these subjects, but especially on the pastoral life, whatever pertains to the duty of a *seelsorger*, or soul-overseer, the lectures are such as might be expected from the piety, learning, and sound judgment of the late Professor Vinet. The appendix contains a variety of papers which increase the value of the volume, chiefly extracts from authors made by M. Vinet, and apparently used by him during his course of lectures. A prefatory note by the translator, with a few facts about Vinet, as a professor, and the French editors of the work, would have been acceptable. A treatise by M. Vinet, on Homiletics, or 'The Theory of Preaching,' is promised in the preface of the 'Pastoral Theology,' by the same editors in whose hands are his MS. lectures, and we trust it will be published speedily.

The Chemistry of Gold, with Modes of Mining, Washing, and Assaying Gold Ores. By J. Scoffern, M.B. Orr and Co.

IN the cheap series of works published under the title of 'Readings in Popular Literature,' there have already appeared several numbers connected with the Australian gold regions. To the contributions of Mr. Mossman and Mr. Mackenzie, describing from personal observation the state of the colony, and narrating particulars about the diggings, (*ante*, p. 675.) another treatise is now added by a scientific writer at home, intended to serve as 'The Gold-Seeker's Chemical Guide.' In plain popular style Mr. Scoffern describes the natural history of gold, with its geological distribution, specially referring to the Australian deposits; then the chemical properties are given, with accounts of the various modes of mining, washing, and assaying the ores. A formal treatise on gold metallurgy is not attempted, but general principles are clearly stated, and a sufficient number of details given to guide ordinary operators at the diggings. The book contains a great number of well-executed illustrations, both in the geological and metallurgical part of the treatise. Although the subject is the 'Chemistry of Gold,' so much of the chemistry of associated or collateral bodies is added, as may enable an operator previously ignorant of chemistry to prosecute the main object of his research. Account is therefore given of several other metals, and of the substances employed in extracting them from their ores. For use in Australia some of the processes are not required, but the book is applicable to the gold deposits of all parts of the world, of some of the most remarkable of which, as the Uralian, Brazilian, Hungarian, and Californian, notices are given. While Mr. Scoffern's book contains much interesting matter for the general reader, it will be indeed a useful manual to the gold-seeker, varied scientific information being turned to the best account for practical guidance.

Caii Sallustii Crispi Catilina et Jugurtha. An edition for Schools. By Charles Merivale, B.D. Cambridge: Macmillan and Co.

THIS is far the best school edition of Sallust hitherto published in this country. The text is given after the edition of Kritz of Leipzig, collated with the latest edition of Gerlach, published this year at Berlin, and in some parts corrected according to MS. readings. The annotations, which form almost as much matter as the text, are principally drawn from the variorum notes of Havercamp's edition, from Gerlach and Kritz, and a few from a recently published edition by Dietsch. Mr. Merivale displays good judgment in the selection of the notes, and the historical and biographical introduction is ably written. We are much pleased, both with his estimate of the historian's personal character, and with the critical remarks on his style and his works.

SUMMARY.

IN the cheap and popular series of books entitled 'The Library for the Times,' a tale of the days of James I., *The Treasure-Seeker's Daughter*, by Hannah Lawrance, presents a faithful and spirited picture of the age, chiefly in regard to the ecclesiastical questions then dividing England. The religious persecutions which ultimately led, far more than any political oppression, to the civil war, are here narrated on the authority of contemporary records, and the principles involved in them are well illustrated in the story. The incidents of the tale are imaginary, but always in accordance with what is known of the history of the times; and in the historical persons introduced, their own recorded words are generally put into their mouths. The work is thus historically instructive, as well as amusing as a work of fiction. The allusions to English domestic life, and especially to London scenes, in the early part of the seventeenth century, give a tone to the book which will please readers who little sympathise with the author's ecclesiastical or political views. The characters of James I., and of 'Steenie,' the favourite Buckingham, are drawn in no flattering manner, but having had occasion lately to examine some records relating to the British Solomon and his court and family, we have authority for stating that Miss Lawrance's book accords with actual history.

We have no wish to advise any of our readers to become 'Spanish bondholders,' but for geographical information they may read with profit *A Sketch of the River Ebro*, by William Walton, showing its course through Spain until its discharge into the Mediterranean, derived from the best local authorities, chiefly the 'Geographical and Statistical Dictionary of Spain,' by Don Pascual Madoz. An outline is given of the professional survey made previous to the formation of the Ebro Canalization Company. Of the financial position and prospects of this association, formed under a grant from the Spanish Cortes, it is not for us to speak, but the country with which it is connected is wonderful, both in its history and its resources, of which Mr. Walton gives a glowing description.

Dr. Matthias Roth, physician to the Hahnemann Hospital, publishes two works on subjects the importance and utility of which will be admitted by others than homœopathic practitioners. One is entitled, *The Russian Bath*, with ample details as to its mode of operation, and the diseases in which it is beneficial. The other is an account of *Ling's System of Gymnastic Exercises*, containing directions for the best means of developing and strengthening the organism of the young. The latter work is far too formal in its character, but many useful hints may be gathered from it by parents and teachers. The treatise is extracted from a larger work by Dr. Roth, 'On the Prevention and Cure of Disease by Movements, &c.'

Under the somewhat defiant title of *Romanism an Apostate Church*, a zealous Protestant, styling himself 'Non-Clericus,' has compiled a work full of very curious and important matter bearing upon all points of the Popish controversy. His own statements are too violent in their tone, but the

extracts, collected from many works, and arranged under commonplace heads, render the book useful for reference to those interested in the subject. The compiler intends his work to be a storehouse of arguments against 'Tractarians' as well as 'Romanists.'

The subjects of the following publications are sufficiently indicated by their titles. *An Ode to Louis Napoleon*, by G. W. F., an indignant tirade against 'the usurper.' *A Lecture on the Australian Gold Fields*, delivered at the Polytechnic Institution, by Mr. J. H. Pepper, F.G.S., a plain statement, suited to the audience at that place of popular instruction. A new monthly educational magazine, *The Christian Student*, intended and well adapted for the use of youths in the upper parts of English schools. *Elementary Manual of Physical Geography*, one of a series of cheap educational manuals published by Groombridge, who also has a series of *Elementary Catechisms*, similar to the well-known, but now a little obsolete, 'Pinnocks.' *The Temperance Offering*, consisting of miscellaneous essays, tales, and poetry, edited by James Silk Buckingham, President of the League, a neat little book published on the occasion of a recent temperance festival and bazaar at the Surrey Gardens, a few weeks ago. On the same subject there is a poem in three cantos, *The Triumph of Temperance; or, The Destruction of the British Upas Tree*, by John O'Neill, author of various poetical works. The poem is in Spenserian stanzas, and describes the evils of intemperance and the blessings of abstinence in earnest verse. A sermon preached in Surrey Chapel, the well-known scene of Rowland Hill's pulpit labours, by the Rev. Albert Barnes, of Philadelphia, the distinguished commentator, is entitled *The Throne of Iniquity; or, Sustaining Evil by Law*, being a plea in behalf of a law prohibiting the traffic in intoxicating drinks. We will first see how the famous 'Maine Liquor Act' works in America, meanwhile wishing all success to the cause of temperance ably advocated in these and many useful works issued under the sanction of the London Temperance League. A curious contribution by a Scottish teetotaler varies this group of temperance works, *Rhymed Convictions*, being songs, hymns, and recitations for social meetings and firesides, by Walneerg—the name of the author backwards, we suppose. Mr. Greenlaw's design is good, and some of his songs have humour as well as point, but unhappily much of the cleverest lyric poetry of Scotland is devoted to drunkenness and debauchery, compared with which the literary fame of more virtuous verses is apt to suffer. But these songs we can at least say are very appropriate for those for whose use they are intended. We are glad to see rhyme aiding reason and religion in the attempt to lessen the vice which is Scotland's national disgrace. The best pieces in the book are parodies of old Scottish songs.

Among Bohn's books for this month are, in the 'Classical Library,' the second volume of the comedies of *Plautus*, literally translated, with notes, by Henry T. Riley, B.A.; and in the 'Standard Library,' *Frederika Bremer's Works: The President's Daughters*, translated by Mary Howitt, a volume which will multiply the number of the admirers of Miss Bremer's writings in this country.

LIST OF NEW BOOKS.

- Annette, a Tale, by W. F. Deacon, 3 vols., £1 11s. 6d.
 Arnold's School Classics, Hecuba of Euripides, 12mo, 3s.
 Aunt Phillis's Cabin; or, Southern Life as it is, p. 8vo, 5s.
 Bourne's (John) Treatise on Screw Propeller, 4to, £1 18s.
 Catechisms, and Irish Highlands Guide for Tourists, 2s.
 Choice Descriptive Poetry, 12mo, cloth, 2s.
 Evans's Rectory of Valehead, foolscap 8vo, cloth, 3s.
 Edwards's Latin Grammar, 26th edition, 12mo, 2s. 6d.
 Glen's (W. C.) Poor Law Statutes, 12mo, boards, 2s. 6d.
 Goethe's Conversations with Eckermann, 2 vols. 8vo, 10s.
 Giff's (Thomas) Vallis Eboracensis, 8vo, cloth, 10s. 6d.
 Gossion's Mormons, or Latter Day Saints, cloth, 3s. 6d.
 Hogg's Instructor, Vol. 9, 8vo, cloth, 4s. 6d.
 Hunt's Men, Women, and Books, 2 vols. post 8vo, 10s.
 — Autobiography, 3 vols. post 8vo, cloth, 15s.
 — Imagination and Fancy, 1 vol. post 8vo, cloth, 5s.
 — Wit and Humour, 1 vol. post 8vo, cloth, 5s.
 — Jar of Honey, 1 vol. fancy boards, 5s.
 — Table Talk, 1 vol. post 8vo, boards, 3s. 6d.
 Household Words, Vol. 5, 8vo, cloth, 5s. 6d.

- Jervis's (J. J. W.) Genesis Elucidated, 8vo, cloth, 12s.
 Kavanagh's Woman in France, 2 vols. post 8vo, cloth, 12s.
 Louis's School Days, by E. J. May, foolscap 8vo, cloth, 5s.
 Lowre's (Jacob) Spelling and Dictation Lessons, cloth, 1s.
 Murphy's Lectures on Midwifery, 8vo, cloth, 16s.
 Marryat's Children of the New Forest, 2 vols. 12mo, 10s.
 Morris's Book of Natural History, 16mo, 10s. 6d.
 Morison's Religious History of Man, post 8vo, 3s.
 Parkinson's (R.) Old Church Clock, 4th edition, 4s. 6d.
 Round (O. S.) The Indian Wife, 1s.
 Registrar General's Tenth Report, 8vo, cloth, 3s. 6d.
 — Eleventh Report, 8vo, cloth, 3s. 6d.
 Steinmetz's Novitiate, 1 vol. post 8vo, cloth, 5s.
 Songs of Scotland without Words, royal 8vo, boards, 7s.
 Smith's (Rev. James) The Book that You Want, 1s. 6d.
 Stanbury's Expedition to Valley of Salt Lake of Utah, £1 5s.
 Smith's (C. H. J.) Parks and Pleasure Grounds, 6s.
 Testimony to the Truth, by a Converted Atheist, 3s.
 Thomson's (Edward) Adventures of Barnaby Lee, 8vo, 5s.
 Toogood's Sketches of Church History, 18mo, cloth, 2s.
 Uncle Tom's Cabin, 12mo, cloth, 2s. 6d.
 — crown 8vo, cloth, illustrated, 2s. 6d.
 — illustrated by Leech, 12mo, 3s. 6d.
 — 12mo, cloth, 2s. 6d.
 Vetch's (Major), The Gong, or Reminiscences of India, 4s.
 Wordsworth's Occasional Sermons, 8vo, cloth, 8s.
 White Slave (The), crown 8vo, cloth, illustrated, 2s. 6d.
 Wyatt's Industrial Arts, 3rd division, folio, boards, £3 3s.
 — Metal Work and its Artistic Design, £4 14s. 6d.

THE DUKE OF WELLINGTON.

THE illustrious man, whose death has been this week recorded, has so long been identified with the history, not of England only, but of the world, that few fail to feel a near interest in one whose influence was universally pervasive. While the public journals are filled with the records of his military and political life, we confine ourselves to a brief notice of his literary distinction, which is apt to be thrown into the shade by the brilliancy of his active services in the field or the senate. Some great soldiers have been also able writers, but few have professedly narrated their own exploits. Cæsar did this, nor could any one in all the ages since have succeeded so well in a personal narrative as Wellington. Whether he has left any memoir of parts of his own life, in the papers committed to Lord Mahon, as literary executor, we are not aware; but the clear, terse, vigorous style of the 'Despatches' satisfy us that he might have written a history equal in literary excellence to 'Cæsar's Commentaries.' Even in the haste of his epistolary writing there is a forcible brevity and point, which would have doubly told in a formal and carefully-prepared history. As it is, the literary merit of the 'Wellington Despatches' is high. The very first of his letters given by Colonel Gurwood has often been cited as characteristic of the man, as it is also of his style. But open the volumes at any page, and passages as striking will be found. There is never any difficulty in knowing what Wellington means. He says in the plainest and fewest words possible what he thinks, or feels, or desires at the time. Never carried away by enthusiasm, never striving after effect, his language is always an expression of his clear intellect and strong will. Sometimes there are marks of deep feeling, and at others of playful humour, but the staple of his written works denotes clear, sensible, and vigorous thought. The same straightforward utterance appears in his speeches, although the difficulty of his delivery oftener led him into confusion, error, and repetition, than when sitting pen in hand. But how characteristic of the whole spirit and way of the man is this one sentence concerning popular clamour, spoken in the House of Peers in May, 1843:—"For myself, I can only say that I have been for a great number of years in the habit of treating such criticisms and such assaults with the smallest possible attention; and I shall continue to do my duty to my sovereign, or elsewhere, and continue to treat the language referred to with as little attention as heretofore, and I recommend noble lords on both sides of the House to follow my example in this respect." Thus, also, in the concluding sentence of that memorable declaration against Reform in 1832, how admirable is the manly decision and undiplomatic directness of his language:—"In conclusion, I beg to state that not only is the government not prepared to bring forward any measure of this description, but that, so far as I am concerned, whilst

I have the honour to hold the situation I now do amongst his Majesty's counsellors, I shall always feel it my duty to oppose any such measures when brought forward by others." There was no room for mistake nor misunderstanding here. His own resolution was stated, and as everybody knew he would keep to it, measures must be taken accordingly. How great the contrast in the language of our most eminent surviving politicians, even those who have most name for honour and integrity!

To any part of the long and eventful life of Wellington we need not refer, as everything recorded concerning him is being published so widely by the daily press, but the manner of his removal we cannot help alluding to, for an historical contrast which it suggests. When Samuel Johnson was selecting instances of "The Vanity of Human Wishes," the end of the great captain of a former age occurred to him, and he coupled with it that of one not less famous in the public annals of the time,—

"From Marlborough's eyes the tears of dotage flow,
 And Swift expires a driveller and a show."

Wellington knew no dotage. Bright and clear in intellect, though growing feeble in bodily power, he was to the last, if we reckon ripeness of wisdom along with honesty of purpose and vigour of action, what Talleyrand called him long ago, "the most capable man in England." The other great "man of the time," Sir Robert Peel, also was removed before age had dimmed his faculties or destroyed his usefulness. Future historians, in speaking of the death of Wellington and of Peel, will note the contrast between the fulness of their earthly honour and the vanity of human wishes in the end of Marlborough and of Swift.

We have been watching in what way the present servile press of France would refer to the death of Wellington. One sentence from the 'Siècle' will suffice to indicate the general tone of reserve with which the event is spoken of:—"Le nom de Lord Wellington se rattache aux plus douloureux souvenirs de notre histoire contemporains; général ou négociateur, cet homme célèbre fut l'ennemi le plus acharné de notre patrie. Ce fait suffirait à lui seul pour nous imposer la plus grande réserve." We must remember that the most generous and honourable of the literary men of France are now in exile, and that the press is under the censorship of the flatterers of Louis Napoleon.

THE SCOTCH REAPING MACHINE.

IN our paper of the 14th August (*ante*, p. 628) we gave an account of an interesting trial that had been made in Perth, at a meeting of the Highland and Agricultural Society, between Hussey's reaping machine, and one invented five-and-twenty years ago by Mr. Peter Bell, of Inchmichael, in the Carse of Gowrie; and we showed on good authority that the superiority of the Scotch over the American reaper was beyond all question. A deputation from the Royal Agricultural Improvement Society of Ireland attended on this occasion to solicit a trial of Mr. Bell's reaping machine in the sister isle, and it chanced that we were present last week with Lord Talbot de Malahide, and an interested body of farmers, at the experiment. It was not a trial of competition with the famed American reaping machines, but simply an exhibition of the powers of the Scotch one, on a farm belonging to Mr. Thompson, some ten or twelve miles from Dublin. The regularity and neatness with which it took up the straw within a few inches of the ground, and the precision with which the cut stems were laid over on one side in continuous order for the binders, was truly surprising. With the gentle labour of a couple of horses, a driver, and a director, Mr. Bell's machine, which is remarkable for the simplicity of its construction, does the work of about ten reapers, in the most complete and satisfactory manner. It appears that Mr. Bell has been using this machine with great success upon his own farm for the last twenty years, and, as long back as 1828, the following report was given of its capabilities by a large and influential body of practical agriculturists:—

"Powrie, 10th September, 1828.

"We, Proprietors of land, Farmers, and others, have this day witnessed the operation of Mr. Peter Bell's Reaping Machines, at Powrie, in the county of Forfar. They were employed in cutting down oats, barley, and wheat, on ground of uneven surface and considerable declivity. Each machine was about five feet broad, and consequently cut down this breadth of corn as it passed along. The stubble was from three to four inches high, completely free from loose straw, and the cut corn was deposited on the side of the machine, as it advanced, in a very regular manner; and without rolling, was collected into compact and well-formed sheaves, with the greatest facility and despatch."

That so much publicity should have been given of late to the competing merits of the American reaping machines of the Great Exhibition, while we have one in Great Britain, of five-and-twenty years' standing, of superior powers, is only to be accounted for on the principle that 'a prophet is not without honour, save in his own country.'

BRITISH ASSOCIATION.

SECTION A.—(Mathematical and Physical Science.)

THE business commenced on Saturday with the reading of a brief report by Prof. J. D. Forbes, of 'Experiments for the purpose of Testing the Mathematical Theory of the Conduction of Heat.' Illness prevented the writer from pursuing the inquiry, but as far as he had gone his results were consistent. One important result, however, he could not withhold: his experiments prove that the conductivity of iron diminishes as its temperature increases. We may apprise our readers that so far back as 1845, M. Lanberg arrived experimentally at the same conclusion in regard to steel, lead, and tin; his experiments are published in the sixty-sixth volume of Poggendorff's 'Annalen.' With copper, no diminution was observed by M. Lanberg; but in the case of the three metals above mentioned, the conductivity was proved to be a function of the temperature. It is, however, an important point, which needs further confirmation; and Prof. Forbes's known care and conscientiousness as an experimenter peculiarly fit him for so important an inquiry.

A paper 'On the Laws of Magnetism and Diamagnetism,' by Prof. Matteucci, addressed as a letter to Prof. Faraday, was next read. M. Matteucci's experiments were chiefly directed to ascertain the influence of temperature and of mechanical pressure upon the magnetic and diamagnetic capacities of bodies. He shows that iron loses an enormous amount of magnetic power in passing from the solid state to a state of fusion. In the latter state, the attraction exerted upon it by a magnet is fifteen million times less than when the iron is cold and solid. The power of diamagnetic substances in general does not appear to be affected by a change of temperature; bismuth, however, forms an exception here, for when fused it is a perfectly neutral body, being neither attracted nor repelled. We have little doubt that when the experiment which led to this conclusion is reconsidered by its author, the conclusion itself will undergo considerable modification. The fact first established by Tyndall, that the compression of bismuth alters its diamagnetic power, is further proved by the experiments of M. Matteucci. He cites a number of compound substances whose constituents are diamagnetic, but which themselves are magnetic—a result which, if placed beyond a doubt, would possess great interest. From the opinion of the non-polarity of bismuth, advocated by Prof. Faraday, the writer dissents, and considers, with Weber and others, that the simplest way of explaining diamagnetic phenomena is to assume a polarity, the same in kind as that of iron, but the reverse in direction. With regard to the result arrived at by M. Matteucci, that magnetic compounds may be formed of diamagnetic constituents, we would make one remark. The diamagnetic power of some of these substances is so exceedingly feeble, that the slightest accidental impurity, arising from incautious handling or from other causes, is often sufficient totally to reverse the action, and to cause a really diamagnetic substance to be attracted as if it were magnetic. A reference to Plücker's earlier experiments on crystalline bodies

will sufficiently demonstrate the truth of this: and will, we imagine, induce an extreme degree of caution in admitting the result, that any combination whatever of purely diamagnetic matter can produce matter which is magnetic.

Mr. Hennessey read a paper 'On the Connexion between Geological Theories and the Theory of the Figure of the Earth.' The author discussed at some length the rival claims of the Neptunists and Plutonists, and decided in favour of the latter. He dwelt, however, upon the great changes which must have been induced by the contraction of the earth's crust, inasmuch as it has been proved experimentally, that granite, in passing from a state of fusion to the solid condition, is diminished by one-fourth of its volume.

Sir David Brewster described a new and simple polariscope, and remarked on some New Phenomena of Diffraction. Sir David appears to retain his ancient dislike to the optical theory of undulation, and loses no opportunity of testing its soundness, by throwing difficulties in its way. The present communication gave rise to a prolonged discussion between Sir David and Prof. Stokes, the latter expressing his belief that the particular phenomena observed by Sir David, which consisted of fringes of a peculiar character, were explicable according to principles laid down by Fresnel, while the veteran emissionist could not discern any possibility of an explanation according to those principles.

M. Claudet described a new Manifold Binocular Camera; the peculiarity of the instrument consisted in its enabling the photographer to take four pictures in the course of a few seconds. It was so constructed, that the axes of the collecting lenses belonging to the two chambers could be readily brought to any required convergence; the relation between distance and convergence was exhibited by a diagram. Mr. Twining made a communication 'On an Instrument for obtaining Correct Representations of Objects from Nature.'

Prof. W. Thomson addressed the Section 'On the Equilibrium of Elongated Masses of Ferro-magnetic Substances in uniform or varied Fields of Force.' He showed, first, theoretically, the manner in which the particles of a magnetic body influence each other's action. Suppose a cube of soft iron to be placed between the two poles of a horse-shoe magnet, it will present to the north pole of the magnet a south pole, and to the south pole of the magnet a north pole. Let another similar cube be placed beside the former, and in the line which unites the two poles; the latter cube will, by the action of the magnet alone, have also a north and south pole excited like the former; but now these two cubes being magnets, must re-act upon each other, and it is manifest that in the position which we have assumed, where the cubes are supposed to lie one after the other along the line which unites the poles, the north pole of one cube will be opposed to the south pole of the other, the direct consequence of which will be a strengthening of the action of both. But if we suppose the cubes so placed, that the length of the compound prism formed by both is perpendicular to the line which joins the poles, the cubes will represent a pair of magnets placed parallel to each other, with the north pole of one beside the north pole of the other, and the south pole of the one beside the south pole of the other; the manifest result of this arrangement will be, that the mutual action of the cubes tends to weaken the magnetism which each derives from the influencing magnet. Grounding himself upon this theoretic view, Prof. Thomson exhibited a variety of experiments illustrative of it. Thus a single cube of iron placed on the end of a lever in the magnetic field, will take up a position totally different from that it would assume if three cubes were placed end to end along the arm of the lever; and by varying the number of cubes, those at the extreme end of the row might be made to take up various positions of equilibrium.

Dr. Tyndall addressed the Section on 'Poisson's Theoretic Anticipation of Magne-crystalline Action.' In the March number of the 'Phil. Mag.' for 1851, Prof. Thomson cites extracts to prove, that magne-

crystalline action was anticipated by Poisson in his 'Theory of Magnetism;' and in the 'Annual Report' of Liebig and Kopp, Dr. Tyndall's researches are referred to as especially corroborating this view. Highly as he prized the support of Prof. Thomson on a scientific subject, he must decline subscribing to his views on the present occasion. Poisson supposed a magnetic body to be an assemblage of magnetic molecules; and, speaking of crystals, he throws out the surmise, that the magnetic molecules in their case may not be spherical, but ellipsoidal, the major axes of the ellipsoids having a uniform direction. If such a body be magnetised, its attraction along the line of the axes will be different from the attraction in a line transverse to the axes. A differential action like that here spoken of was certainly established by the experiments of Prof. Faraday and Dr. Tyndall; but its cause is not to be referred to the shape of the molecules, as supposed by Poisson. Through the kindness of the Catholic bishop, Dr. Denvir, who furnished him with a powerful electro-magnet and battery, Dr. Tyndall was enabled to demonstrate his views experimentally. A crystal of calcined spar was hung in the magnetic field—its optic axis set equatorial. A model of white wax of the same shape and size as the spar, and almost to be mistaken for it, was suspended in the same place—its axis also set equatorial. A crystal of carbonate of iron was next examined—its axis set from pole to pole. A magnetic model of this crystal did the same. It was there shown experimentally, that a bar of magnetic or diamagnetic matter might be caused to set axial or equatorial, by changing its point of suspension. The experiments were closely watched by Prof. Thomson, who certified the success of every one of them. "Now," proceeded Dr. Tyndall, "we have here two bodies exactly alike in exterior shape; the one a crystal, built by nature—the other a model, constructed by myself. The actions of both are identical; the one is not to be distinguished from the other; whatever explains the deportment of the model will also explain that of the crystal. But it will not for a moment be imagined that I possess any power to change the shape of the molecules; all I can do is, to alter their manner of arrangement, and this I have done in the cases submitted to you, by compression. Now, Poisson never once mentions the influence of molecular arrangement, but confines himself solely to the consideration of molecular shape; and hence it is that I feel called upon to dissent from those who consider his theory an anticipation of the discovery of magne-crystalline action."

Prof. Thomson, in reply, stated that he never meant to say that the physical theory of Poisson was true; indeed, he believed it to be radically false. He could not conceive a fundamental difference to exist between him and Dr. Tyndall on this subject. The researches and discoveries of Dr. Tyndall had cleared away a mass of rubbish from this portion of science. He had himself, in many cases, repeated and varied Dr. Tyndall's experiments in all possible ways, and found them true to the letter.

SECTION B.—(Chemical Science.)

President.—Thomas Andrews, M.D., F.R.S.
Vice-Presidents.—Professor Apjohn, M.R.I.A.; Professor Connell, F.R.S.E.; Professor Faraday, F.R.S.; Professor Graham, F.R.S.
Secretaries.—Professor Hodges; Professor Ronalds; Dr. Gladstone.
Committee.—John C. Boyd, Esq.; J. S. Brazier, F.C.S.; G. B. Buckton, F.C.S.; A. Claudet, Esq.; G. Gladstone, F.C.S.; Dr. H. Head; Professor F. W. Johnston; T. J. Pearsall, Esq., F.C.S.; W. B. Ritchie, Esq.; J. W. Smyth, Esq.; W. Sykes Ward, F.C.S.; John Wilson, Esq.; Robert Warrington, Esq.; Francis M. Jennings, Esq.; Alex. Harvey, Esq.; Alex. Macdonnell, Esq.; Dr. J. H. Gilbert; M. Delesse; W. J. Russell, Esq.

It frequently happens that there are papers brought before the Chemical Section, which are listened to by large and attentive audiences—but they are those which refer to the application of Chemistry to the Arts, or its connexion with other branches of Natural Philosophy; and when some philosopher rises and begins a purely scientific

communication, his audience rapidly disappears, leaving only a choice few scattered over the front benches, to whom he may continue to detail his numerical results and symbolic equations. Fortunately there were few papers of this abstruse character at the Belfast meeting.

One subject, lying at the basis of all analysis, was however noticed in two distinct communications, namely, the determination of the atomic weights of certain elements. Professor Andrews, the President of the Section, had determined the equivalent number of platinum at 98.94, and of barium at 68.789; and Mr. Macdonnell assigned the number 12.07 as that of magnesium. The reading of these papers gave an opportunity for many remarks, especially on the law propounded by Prout, that the atomic weights of the other elements are multiples of that of hydrogen—a law which, however much it may apply to certain classes of elementary bodies, is unquestionably untrue in the majority of cases.

Professor Graham gave some valuable notices of experiments on the endosmose of liquids. He described an instrument, termed an osmometer, by which he measured the diffusion of solutions of salts through porous membranes into water, and he had arrived at several curious results, not the least among which was the almost entire abnegation of the action of exosmose. He classified solutions of salts, and other liquids, according to their diffusibility through membranes; among the most diffusible being the combinations of the alkalis with the vegetable acids—a curious fact when we consider the presence of these salts in the sap of plants.

Although galvanism is a power entirely dependent on chemical action, not a word was said about it in this Section—but other forces were not so lightly passed over. Heat came in for its share of attention in the opening paper of the meeting—Dr. Woods 'On the amount of Heat produced by the Combination of several Metals with Oxygen,' followed by another, headed 'On Chemical Combination,' in which the author developed a mechanical theory of heat, applying it to the explanation of chemical phenomena.

Professor Apjohn answered in the negative the question, 'Is the mechanical power capable of being obtained by a given amount of caloric employed in the production of vapour, independent of the nature of the liquid?'

Light, in its bearing on chemical science, was particularly noticed. It formed the subject of two reports—the one by Dr. Gladstone, the other by Mr. Hunt. Dr. Andrews proposed the polarizing power of the crystalline plates of double chloride of sodium and platinum as a test for minute quantities of soda; and Professor Stokes treated on the application of certain optical phenomena to chemistry. Dr. Gladstone described a number of experiments, showing the influence of the solar radiations, obtained by passing light through variously coloured media, on the vital powers of plants growing under different atmospheric conditions. The plants in question were of a very various character—hyacinths, wheat, grass, mallows, and panies; and were placed under large bell jars of colourless, blue, red, and yellow glass, and others partially darkened.

Professor Stokes repeated in the Section some of the experiments of which he had spoken in his long and interesting evening lecture, on the rendering luminous of some of the invisible chemical rays of the spectrum, and proposed various spectra—of which he had beautiful diagrams—as tests of the presence of certain chemical substances, such as titanium, cobalt, manganic acid, sulphate of quinine, and chlorophyll, the colouring matter of green leaves. The reading of the paper was followed by an animated discussion by Sir David Brewster, Professor Graham, and others, on the history and application of these optical discoveries. Mr. Robert Hunt's report had reference to the subject of photography, and also treated of some of these chemical spectra.

The peculiar geological character of the rocks of the neighbourhood afforded an opportunity to the

chemists of Belfast of adding to our store of mineralogical knowledge. It appears that the green sand, which is plentifully scattered over the province of Ulster, is filled with nodules, which Professor Hodges showed to contain from thirty to fifty per cent. of phosphate of lime, and he pointed out the valuable application of this to agricultural purposes in the place of bone manure. The President, Dr. Andrews, brought before the Section many results of his microscopic and chemical examination of the basalt, trap, and metamorphic rocks of the north of Ireland. The most curious of his observations related to the occurrence of small crystals of yellow pyrites and of magnetic oxide of iron throughout all these rocks. He extracted the crystals of oxide from the powdered mineral by means of a magnet, and found them accompanied in some instances, especially in the case of the basalt from a hill near Ballymena, by minute quantities of iron in a metallic state, a condition in which iron is scarcely known to exist among natural products, except in aërolites, which cannot be considered as part of the terrestrial globe. In examining many crystals of magnetic oxide Dr. Andrews had never discovered lime as a constituent, but magnesia frequently replaced the protoxide of iron, as in one remarkable specimen from the schist rocks of the Mourne mountains, the analysis of which formed the subject of a distinct communication.

Professor Tennant entertained the Section with a mineralogical disquisition on diamonds, and with a full account of the history, peculiarities, and present treatment of the famous Koh-i-noor. He mentioned the precautions that he had recommended in the process of polishing, to prevent its splitting, as there is a dangerous flaw in the direction of cleavage. He surprised the audience by propounding his opinion that the Koh-i-noor, the slab described by Dr. Beke at the last meeting of the Association, and the great Russian diamond, are parts of one and the same large crystal. Sir David Brewster expressed his doubts as to whether the diamond in the Great Exhibition could lay claim to being the real Koh-i-noor, but Mr. Tennant stoutly maintained its authenticity.

Dr. Gilbert read a lengthy account of experiments made by himself and Mr. Lawes 'On the Composition of Food in relation to Respiration and the Feeding of Animals.' Those who are acquainted with the careful and persevering manner in which these extensive investigations are carried on on Mr. Lawes' estate at Harpenden, will know how to estimate the value of the data which are now being accumulated by them on the subject of agricultural chemistry.

A large collection of anastatic paper for the prevention of forgery was exhibited by Mr. Bateson, but there were brought before the Association some matters of Chemistry applied to the immediate use of man, which had a special interest with relation to Ireland. Mr. Brazier described a mysterious kind of butter which is sometimes found in the Irish bogs, the origin of which remains in obscurity. Dr. Ronalds, Professor of Chemistry at Galway, brought forward the subject of the oil obtained from the liver of the immense sunfish caught on those shores. It is remarkable as being the oil of lowest specific gravity known, and he thought it might be brought into use in many ways, affording a new branch of industry for the fishermen of that destitute region, especially as with an improved method of capture many more fishes than at present might be easily taken.

One of the most interesting papers which were brought before the Section was that by Dr. Hodges 'On the Growth and Treatment of the Flax Plant.' He traced the use of this plant in Ireland from the earliest period; gave a minute account of a crop grown by himself to illustrate its cultivation; detailed analyses of some proximate constituents; and described the whole process of preparation of the fibre for the spinner. Besides the ordinary methods, he spoke of an entirely new process for removing the epidermis from the real flax (patented by Mr. Watts). It is effected by means of exposing the stalks to the influence of steam confined in closed chambers and squeezing them between long rollers.

This paper was abundantly illustrated by diagrams of apparatus, and samples of the material in every stage, from the plant as taken from the field till it is worked up into fine damask. A brisk discussion followed the paper, in which several manufacturers took an active part, and Claussen's process for converting flax into an imitation of cotton was supported by Dr. Ryan, and freely canvassed by others. The numerous works in Belfast and its vicinity afforded to members of the Association ample opportunity of examining the whole preparation of flax. The plant grows abundantly in the fields. It was being cut down and stacked at the time, and parties of chemists visited Schenk's steeping works, where they saw the flax lying in large vats of heated water undergoing fermentation, by which the outer coating is removed, and as according to Dr. Hodges this is the butyric fermentation, it may be readily imagined that the odour emitted was strong, and anything but agreeable. In the same establishment was seen the process of scutching, by which the central woody matter is broken up and removed. The flax-mills in the neighbourhood exhibited the further process of hackling, by which the fibre is thoroughly cleansed previous to being spun into thread and woven into a variety of textures. An excursion was made on the Saturday by all the principal chemists to the bleaching works of Fenton and Co. Here they saw the linen steamed in large wooden vats, and alternately immersed in a solution of chloride of lime mixed with carbonate of soda and of sulphuric acid. Many times during this process the linen is violently beaten about by large wooden arms in a stream of water. The party was then conducted to machines in which the linen is rubbed with a strong soap, then to another by which it is starched, and subsequently to the beetles, where by a long continued thumping the peculiar gloss is imparted to the linen fabric. The party after this drove to the vitriol works of W. Boyd and Co., where are prepared not only oil of vitriol, but also the carbonate of soda and chloride of lime used in the bleaching process. They were conducted over the enormous leaden chambers in which the sulphuric acid is made, to the leaden cisterns where it is concentrated, and the platinum still in which the evaporation is completed; and then off among the salt and condensed hydrochloric acid, and the coal, chalk, and sulphate of soda waiting to be mixed together to form in the furnaces the 'black cake,' from which the alkaline carbonate is extracted; and in the midst of all this were retorts for the evolution of chlorine gas, which, passed over lime, forms the bleaching powder. Leaving this, the chemists visited the starch and glue works of Mr. Tucker, where they beheld meal converted into starch, and rough scraps of hides and hoofs into glue and size. Those who wished to see the further progress of the linen manufacture visited the Clonard Print Works, and inspected the various processes by which coloured patterns are impressed on this the staple article of the commerce of Ulster.

SECTION D.—(Zoology and Botany, including Physiology.)

The President in his second address* very justly remarked, that the public takes the greatest interest in generalities, and that the public is right, for 'scientific zoology begins where the details of anatomy end.' The public may be compared to a bee-master—so long as it gets the smooth and sweet results, it cares and need care but little with what long and devious wanderings each scientific insect seeks and brings home its load—still less what may be the source of each honeyed drop, or the shape of each waxen pellet. It may be said to be the fault of English naturalists that they too often forget these truths; that in their zeal to observe details accurately, and to garner up great stores of facts, they are too apt to forget that these are the *means* of science, not its end. The end of science is to generalize the isolated facts with which the mind of the man of science is filled—and which demand all his energy in their ac-

* On the Relations between the Organic Structure of Quadrupeds and their Habits, Economy, and Intellects.

quirement—all his strength of memory in their retention; to get broad general principles, in each of which whole multitudes of isolated truths are bound together by some broad common resemblance through which each suggests the other. It is this hiving up the honey in its comb which the public requires; once stored, the simplest may drink and be satisfied. The hungry man asks for bread, not for raw grain; the general public asks for principles which it can understand, not for facts which it cannot, from the man of science. Let us collect facts as accurately, as minutely, and as diligently as we like, but do not let us imagine ourselves architects on the strength of a heap of well-squared stones and cleverly-carved corbels. If we exclude the 'Demonstration of his views on the Cranial Vertebrae,' by the eminent Hunterian Professor of the College of Surgeons—a demonstration which, however lucid and perfect, requires no place here, as Professor Owen has already given his ideas to the world in *extenso*,* and Mr. Ogilby's address, to which we have already referred, we find that three papers with a more general tendency were read before the Section, by Dr. McCosh, Mr. Huxley, and Professor Edward Forbes. Professor McCosh, 'On the Morphological Analogy between the Disposition of the Branches of Exogenous Plants and the Venation of their Leaves,' endeavoured with great ingenuity to generalize and reduce to a common law the peculiarities which are manifested in the branching of exogenous plants, starting with the theory propounded by Goethe, that all the appendages of plants, whether leaves, bracts, sepals, petals, or stamens, are formed after a common type, and that that type is the leaf. Professor McCosh attempted to show that this theory might be extended further, and that the type of the leaf is not only that of all the appendicular organs, but of the buds and of the branches, and therefore eventually of the whole plant itself. The leaf is to the plant as the microcosm to the macrocosm—it is the plant in miniature—a common law governs the two, and therefore whatever disposition we find in the parts of the leaf, we may expect to find in the parts of the plant, and *vice versa*. Now, the veins of the leaf are the analogue of the branches of the plant, and therefore the venation and the ramification must essentially harmonize with one another. In illustration of the law the Professor pointed out that in reticulated leaved plants (to which alone he referred) there is a correspondence between the distribution of the branches along the axis, and the distribution of the venation of the leaf. In some plants the lateral branches are disposed pretty equally along the axis, whereas in others a number are gathered together at one point, and the plant becomes in consequence verticillate or whorled. The Professor stated, that wherever the branches are whorled, the leaves of the plant, as in the rhododendron, or the veins of the individual leaf, as in the common sycamore and lady's mantle, are also whorled. When the leaf has a petiole the tree has its trunk unbranched near the base, as in the case of the sycamore, apple, &c.; and when the leaf has no petiole the trunk is branched from the root, as in the common ornamental low shrubs, the bay, laurel, holly, box, &c. Professor McCosh exhibited an instrument for the measurement of the angles at which branches, &c. go off, and in 210 species of plants he found the angles of the branches with the stem and those of the veins with the midrib to coincide. The Professor stated in conclusion, that he believed there was a similar unity running through linear-leaved plants and monocotyledons. If substantiated, these views will give greater exactness to our distinctions of genera and species, and will lend more exactness to our ideas of the physiognomy of plants; they will at the same time exhibit an unity of design in the skeleton of the plant, similar to that which exists in the animal world, and so subserve the purpose of the natural theologian. In the discussion, a very interesting one, which ensued, while all acknowledged the value of the Professor's memoir, some, among whom were Professors Arnott and Balfour, appeared to doubt whether the theory

* On the Homologies of the Vertebrate Skeleton.

would hold good if extended to more numerous cases. Professor Allman again drew attention to the question of method. He considered that development demonstrates the vein and the branch to be altogether dissimilar organs; that therefore the fundamental position of Dr. McCosh, the homology of vein and branch, was not proved, and consequently that any apparent resemblances between such dissimilar organs must be received with great caution. Dr. Lankester maintained that the paper before the Section was an admirable exemplification of the results to be obtained by the *à priori* methods of the school of Goethe, Carus, and Oken; while Mr. Huxley made a strong reclamation against any such doctrine, asserting that the *à priori* method, however useful as a stage of the scientific method, as a means of what Dr. Whewell has called *colligating* the facts, not only ceases to be useful if we stop here, but becomes absolutely hurtful. In reply, Professor McCosh repudiated the *à priori* method, and declared himself to be in all respects a Baconian. "Who shall decide," &c., says the old adage. It is at any rate not our affair in this place, and if we have specially indicated this discussion, it is only because we consider it to be an indication that the important question of the proper nature of a true scientific method is beginning to agitate the minds of naturalists. When it is fairly worked out we may expect a new era in the annals of scientific biology.

From an essay on vegetable morphology, we may readily pass to another essentially morphological memoir; we refer to the report of Mr. Huxley upon the structure of the Ascidians. Mr. Huxley stated that he was desirous of laying before the Section an account of some investigations into the structure of the Ascidians, which he had been led to make while endeavouring to form a catalogue of those contained in the collection of the British Museum. The Ascidians—varied as they are in external appearance—present certain general anatomical uniformities, which are capable of being represented by a diagram. To such a hypothetical structure thus represented the author gave the name of the Archetypal Ascidian. From this every actual form can be shown to be derived by very simple laws of modification. The author particularly desired it to be understood that he attached no other meaning to the term 'archetype' than that thus defined. It has been a matter of dispute which is the dorsal and which the ventral side of the Ascidians; there can be no question, however, that the heart is upon one side of the axis of the body, and that the nervous ganglion is upon the other. To avoid all ambiguity, therefore, the author proposes to speak of the *hæmal* and the *neural* sides, in accordance with the nomenclature proposed by him in a memoir 'Upon the Homologies of the Mollusca,' read before the Royal Society. The Ascidian archetype differs from all others in these points:—1. The intestine is always flexed towards the hæmal side. In the Polyzoon it is flexed towards the neural side, as pointed out by Prof. Allman. 2. The tentacles are small, while the pharynx is very large, and serves as a respiratory cavity, its parietes becoming perforated. The author combated the view that the 'branchial sac' of the Ascidian answers to the united tentacles of the Polyzoon—or to the united gills of the lamellibranchiate Mollusk; in opposition to the former view, he endeavoured to show that the tentacles of the Polyzoon are represented by the tentacles of the Ascidian; and against the latter he urged, that the gills of the bivalve mollusk have no representative in the Ascidian, the "branchial sac" of the latter representing not the gills of the mollusk, but the perforated pharynx of *Amphioxus*—an analogy which has already been adverted to by many observers. The author brought forward the structure of the peculiar genus *Appendicularia*, as fatal to the view that the branchial sac of the Ascidian is homologous with the united tentacles of the Polyzoon. Especial attention was directed to the formation of what the author termed the 'atrium,' under which term he included the cloaca and the space

between the branchial sac and the 'third tunic' of writers. The author endeavoured to show that it answers to the mantle cavity of ordinary mollusks; that its excessive development accounts for the presence of the 'third tunic' in the Ascidians; and that Savigny's comparison of an Ascidian to an inverted Patella, had very considerable justice.

The author next proceeded to detail many structural points of interest which he had made out in the genera examined. A minute account was given of the structure of the branchial sac in *Boltonia*, *Cynthia*, *Phallusia*, *Syntethys*, and other genera. The branchial meshes are always true apertures, generally more or less rectangular or oval in shape; but in one species described they were arcuated and semilunar, so as to give the appearance of spiral vessels in the branchial issue. The structure of the dorsal folds, and of the 'endostyle,' a structure first noticed as distinct by the author, in his memoir upon the *Salpa*, was minutely described; and the singular and characteristic variations in form of the peculiar organ of sense, the 'tubercle antérieur,' of Savigny, were pointed out. The 'tubular system,' described in the same memoir, as a peculiar and unique organ in *Salpa* and *Pyrosoma*, was shown to be the form of hepatic organ proper to and universal among the Ascidians. The reproductive organs exhibit remarkable and hitherto almost unnoticed peculiarities, which have led the author to distinguish the simple Ascidian into monothalamous and dithalamous groups, the section *Styela* of Savigny being the type of the latter. Owing to the discovery of a marsupial *Cynthia*, that it is of one whose ova pass through all stages of their development in the atrium of the parent, the author was enabled to lay some interesting embryological facts before the Section. The *Cynthia* in question has the appearance of a compound form; it does not, however, become multiplied by gemmation like the true compound forms, but the originally free-tailed larvæ adhere and become firmly united before the withering away of their appendages. The mass is therefore an aggregation of distinct individuals, not one individual represented by many zooid forms. The development of the muscular tissue of the tail was described, closely resembling that of the muscles of the tadpole, as given by Kölliker. With respect to the structure of the test of the Ascidians, the author stated that he had verified in many new cases the discovery of the presence of cellulose therein in large quantity, made by Schmidt, and extended by Löwig and Kölliker, and by Schacht. In other points the author's results differed somewhat from those of these writers; and after pointing out what he considers to be the true structure, he drew particular attention to the essential identity of the test of the Ascidian with true bone (if for calcareous salts cellulose be substituted) on the one hand, and with the vegetable cell on the other. The physiological distinction between plants and animals which authors have endeavoured to draw upon the ground that the Ascidians do not form cellulose, but only take it from plants, seems incompatible with the circumstance made out by the author, that the Ascidian larvæ contain cellulose while they are yet a mere mass of cells contained within a structureless membrane, and totally without any organs except the tail. The author endeavoured to show that the Ascidians might be divided naturally into groups, by considering, 1st, the arrangement of the organs with regard to the axis, whence the animal may be symmetrical or asymmetrical, according to the relative development of the neural and hæmal regions and of the branchial sac; and 2dly, according to the nature of the tentacles and of the reproductive organs. In conclusion, the author stated that the Ascidian type appeared to be sharply defined from all others, nowhere exhibiting any transition forms.

In the discussion which followed Mr. Huxley's paper, Prof. Allman said, that notwithstanding the arguments which had been brought forward, he still adhered to his own view of the homologies of the organs in the Ascidians and Polyzoa. Prof. Owen agreed with Mr. Huxley's interpretation of the homologies, but objected to the use of the name

Polysa, as the term "Bryozoa," used by Ehrenberg, has the priority. Doubting the justice of the comparison which Mr. Huxley had drawn between the branchial sac of *Amphioxus* and that of an Ascidian, the Professor drew attention to the affinity between the Brachiopoda, Bryozoa, and Ascidians.

The most important and novel communication which was made to the Section, that which combined the most elaborate research into details with the broadest generalization, and which must be considered to be the first attempt to reduce all the facts of the distribution of living creatures upon the surface of the earth to general laws, was the explanation of 'A New Map of the Geographical Distribution of Marine Life,' by Prof. Edward Forbes. Two modes of classifying facts of distribution have been hitherto adopted; either the geographical areas to which peculiar assemblages of animals and plants are confined have been marked out as "provinces," the classification in this case being natural, but purely biological; or certain parallels of latitude, or certain isothermals, being taken as boundary lines, animals and plants have been considered to be distributed according to the "zones" thus marked out,—a convenient, but hitherto an artificial arrangement, though, since the distribution of life must greatly depend upon the climatal conditions indicated by latitudinal and isothermal lines, it had a certain broad and loose correspondence with nature.

The great problem has been to unite these two methods, to ascertain what is the common condition by which the limits both of the "provinces" and of the "zones" are governed; for since the distribution of life in provinces is governed by climatal conditions, and since the climatal phenomena of any one portion of the earth's surface are continuous (approximatively) in a zone round its surface, it is clear that there must be some such general agreement.

Now, Professor Forbes finds that if we lay down the marine provinces according to the knowledge we have of the distribution of species, the lines bounding such provinces latitudinally may be connected across the land by lines which, in the main, correspond with the great features of the arrangement of terrestrial vegetation and animal life. In general the lines on land are drawn in accordance with the isothermal of the month in which the greatest development of animal and vegetable life taken together is manifested within the region. By "greatest development" of life, Professor Forbes means that the greatest number of Vertebrata and Articulata are out and active at the same time, and the greatest number of plants are in flower—phenomena which are co-existent. To the zones included between the lines thus drawn the Professor gives the name of homoiozoic belts. From north to south such a belt corresponds with only a single province, but from east to west it may include several. The various provinces included within any given belt, if they are geographically approximated, resemble one another in consequence of the identity of many of their species; but if they are geographically distant, the resemblance consists in the representation of species of the one by species of the other. Nine homoiozoic belts are to be distinguished, one of which is central and equatorial, and the other eight are contained, four in the northern, and four in the southern hemisphere. These belts are:—1. The north polar homoiozoic belt; its southern limit corresponds very nearly with the isotherm of $54^{\circ} 5'$ in the month of June in Dove's map. It includes only the arctic province. 2. The north circumpolar homoiozoic belt; its southern limit (exclusive of the British area) answers nearly to the isotherm of 59° in June. It contains the Boreal, Sitchian, and Ochotyian provinces, which are wholly representative, any identical species being derived from the arctic province. 3. The northern neutral homoiozoic belt, whose southern limit is the isotherm of 63° in June, and 68° in July. It comprehends the Celtic and Virginian and the Mantchourian and Oregonian provinces. The Celtic and Virginian provinces represent one another, as also probably do

the Mantchourian and Oregonian. 4. The northern circumpolar homoiozoic belt has the isotherm of 68° in May for its southern limit. It contains six provinces, the Lusitanian, Carolinian, Mediterranean, Japonian, Californian, and Aralo-Caspian. 5. The central homoiozoic belt contains the West African, Caribbean, and Panamanian areas, besides the largest of all marine provinces, the Indo-Pacific. 6. The southern circumpolar homoiozoic belt is limited northward by the isotherm of 68° in October, though this does not quite exactly coincide with its marine boundary. It represents very forcibly the northern circumpolar belt, and contains the Peruvian, Urugavian, South African, and Australian marine provinces. 7. The southern neutral homoiozoic belt, limited by the isotherm of 59° in January, contains the east Patagonian and Araucanian provinces. 8. The southern circumpolar homoiozoic belt has for its northern limit the December isotherm of 50° , and contains the Fuegian province. 9. The southern polar homoiozoic belt consists of the antarctic province. Its limit is the isotherm of 41° for December.

The provinces which are referred to were also defined by the learned Professor, but we can here merely enumerate them. They are 25 in number:—1. Arctic; 2. Boreal; 3. Celtic; 4. Lusitanian; 5. Mediterranean; 6. West African; 7. South African; 8. Indo-Pacific; 9. Australian; 10. Japonian; 11. Mantchourian; 12. Ochotyian; 13. Sitchian; 14. Oregonian; 15. Californian; 16. Panamanian; 17. Peruvian; 18. Araucanian; 19. Fuegian; 20. Antarctic; 21. East Patagonian; 22. Urugavian; 23. Caribbean; 24. Carolinian; 25. Virginian. Full reference was made to the authorities from whom the data for the establishment of these provinces were taken.

The Professor further laid before the Section a new nomenclature and re-arrangement of the facts ascertained with regard to the distribution of marine creatures in depth. He now divides the regions of depth into five bathymetrical zones—1. The littoral zone, characterized by *Littorina* and *Purpura*, and occupying the whole space between high and low water marks. In the Celtic province this zone is clearly divided into four sub-regions. 2. The circumlittoral zone, between low-water mark and a depth of about fifteen fathoms. It is the zone of *Laminaria* in the Northern Atlantic, of *Zostera* and *Caulerpa* in the Mediterranean, and of the reef-building corals in the Indo-Pacific province. 3. The median zone, between fifteen fathoms and fifty. This is the coralline zone of the Celtic seas. 4. The infra-median zone ranges from fifty fathoms to a hundred. It is the region of the deep-sea corals in the Celtic seas, and of the red coral of the Mediterranean. 5. The abyssal zone extends from one hundred fathoms downwards. It contains no plants, and animal life seems gradually to disappear in it. In the Celtic seas this region has not yet been properly explored. As a general law it may be said, that as we descend in the sea the regions of depth become of greater extent, and the range of species is greater.

Two or three other papers were read before the Section on Tuesday, to which we must direct particular attention. One of these, 'On the Forces by which the Circulation of the Blood is carried on,' was sent by Mr. Wharton Jones, and contained a physiological discovery of very great importance, which was laid before the Royal Society by its author some time ago. In the wing of the Bat, the main impulse to the circulating fluid is, as in other animals, given by the heart, but in addition, Mr. Jones has discovered that the walls of the veins in this animal contract rhythmically like those of the heart, and any regurgitation being prevented by numerous and appropriately placed valves, they thus assist very materially in forcing the blood onwards. The existence of this rhythmic contractility in the walls of the veins is a fact new to physiological science.

An interesting point in vegetable physiology was treated of by Major Munro, in his communication upon the subject of the transformation of *Egilops* into *Triticum*, the gist of which was, that while our wheat has unquestionably been derived

from the wild *Egilops*, the other kinds of domestic grain have had an altogether different origin.

Finally, Professor Owen read a paper which had been transmitted to him by Dr. Martin Barry, to be communicated to Section D, giving an account of a strange locality for its nest chosen by the Black Redstart (*Sylvia tithys*). At the railway station in Giessen, Hesse Darmstadt, in May, 1852, it was found that a bird had built its nest on the collision-spring of a third-class carriage which had remained for some time out of use. The bird was the black redstart, and the nest contained five eggs. The carriage was attached to a train and sent to Frankfort-on-the-Maine, distant between thirty and forty English miles. At Frankfort it remained thirty-six hours, and was then brought to Giessen, from whence it went to Zöllar, distant five English miles, and having been kept awhile there it again came back to Giessen; so that four days and three nights elapsed between the bringing of the carriage into use and its last return to Giessen. The nest, however, had not been abandoned by the parent birds, but was found to contain five young ones, and it was then removed by the humane wagon-master to a secure place, where he saw the parent birds visit the nest; and he inspected it himself, until at first three, and then the other two young birds had flown, none remaining at the end of four or five days.

It was concluded that one at least of the parent birds must have travelled with the train, to furnish the callow brood with the requisite warmth, shelter, and food; and the conductor of the train to Frankfort assured Dr. Barry, that whilst the train was at Frankfort, and during its short stay at Friedeberg, on the way to Frankfort, he noticed a red-tailed bird constantly flying from and to the part where the nest was situated in that particular carriage. It was doubtless availing itself of the stoppages, to busily collect the insects with which to supply the cravings of the little unfledged and unconscious travellers by that rapid mode of locomotion.

TOPICS OF THE WEEK.

SOME of our tender brethren of the press are apparently angry with the publishers of Dr. Thomson's 'Western Himalaya and Tibet,' because in exposing the ignorance and animus of a weekly newspaper reviewer, it has been insinuated that a five-shilling advertisement of a book is regarded in some quarters as a fee for a favourable notice. We believe the system has become notorious because it has received encouragement. Formerly we were much annoyed ourselves on receiving a book for review, by the offer of an advertisement, with instructions to insert it in the No. of our Journal in which a review appears. In other words, a review was requested in return for the advertisement. The practice, we are told, has in no way diminished, and the sooner it is exposed the better.

The Paris journals state that some time ago the authorities of the British Museum were requested by the French Government to allow casts of certain Greek statues and monuments to be taken for the Museum of the Louvre, but that they rudely refused. It seems to us that this assertion must be erroneous, as it is not at all likely that the authorities of our Museum can have been guilty of such discourtesy and narrow-mindedness. It is certainly desirable that some explanation or denial should be given. The newspapers which make the statement add, that the French Government has most readily acceded to a desire expressed by the proprietors of the New Crystal Palace, to be allowed to take models of Egyptian and other antiquities in the Louvre.

The vacancy caused in the Chancellorship of the University by the Duke of Wellington's death, has caused much stir already at Oxford. A meeting of the resident members of Convocation was held with indecent haste within a few hours after the news arrived, when several names were brought forward and canvassed. To the Earls of Derby and Shaftesbury, and the Duke of Newcastle, have since been added Lord Rosse, the Earl of Carlisle,

and the Earl of Ellesmere. We wonder that Lord Mahon is not also named.

The case of the balloon ascents with animals, referred to by us last week as being brought to public trial at the instance of the Society for Preventing Cruelty to Animals (*ante*, p. 701), has been decided in two courts, the Ilford Petty Sessions and the Westminster Police Court, within the several jurisdictions of which two descents took place. At Ilford, the chairman of the sessions decided that the case came within the limits of the act, 12 and 13 Vict. c. 92. Mr. Simpson, the proprietor of Cremorne Gardens, and M. Poitevin, pleading ignorance of the law, were for the present let off with a small fine, intimation being given of severer punishment on any future appearance. At the Westminster Police Court the summons was dismissed, the magistrate saying that he did so with great reluctance, but on strict interpretation of the law he could not decide that the cruelty of these balloon ascents came within the act, the words of which are "over-drive, ill-treat, abuse, or torture, any animal." He did not doubt that the animals were abused and tortured, but the connexion of these terms with the word 'over-driving' satisfied him that other kinds of abuse of animals were intended, and that "this particular form of cruelty was not contemplated by the legislature." On the same principle, a drover or salesman might 'torture and abuse' cattle in a railway truck travelling to London, but as he is not actually also over-driving them, his cruelty is not reached by the law, — cattle in a railway truck not being contemplated by the legislature. Such is the difference between a country gentleman at Ilford following the spirit, and a town-lawyer at Westminster interpreting the letter of the law.

The long projected scheme for regular steam navigation across the Pacific is now in progress of being carried into execution. The recently incorporated Australasian Pacific Mail Steam Company have contracted for five iron screw vessels of large burden and great power. The vessels are to be built by Napier, of Glasgow (two); Caird and Co., of Greenock; Reid and Co., of Port Glasgow; and Miller, Ravenshill, and Co., of London. The first is to be ready in nine months; and as soon as the others are completed, monthly voyages will commence between Panama and Sydney, *via* Tahiti and New Zealand. At Panama the ships will correspond with the West India mails from Chagres to Southampton.

The Bristol papers announce the death of Mr. Isaac Willson, a mechanic of great ingenuity, who as long ago as 1796 invented a cotton power-loom, by which the raw material was skilfully turned out in complete fabric. The popular prejudice against machinery being then violent, and Mr. Willson's pursuits having been discovered, in spite of great secrecy having been maintained, the mob set fire to his house, and the cotton-machine perished, with all the contents of the building. Mr. Willson in after life became a dentist, but continued to be famous for the variety and cleverness of his mechanical inventions.

Madame Laffarge, whose trial for poisoning her husband created extraordinary sensation in France and Europe some years ago, and has since made her an object of general notoriety, has just died at a place called Ussat. She was thirty-seven years of age, and had only been a short time released from gaol, to which she had been condemned for life. She died solemnly protesting her innocence. We mention her death in this place because she was an authoress, having written, after her condemnation, two or three volumes of 'Memoirs of her Life.' She has also, we are informed, left a manuscript work behind her, called 'Ten Years' Captivity.'

The Scientific Association of France commenced its annual congress at Toulouse a few days ago. Its proceedings thus far have not been of general importance, though some interesting papers have been read. The Association, however, possesses nothing like the importance of the British one, either in the celebrity or number of its members.

The formation of the new electric telegraph to Dover is noticeable from its being the first not

in connexion with railway lines. Being an opposition company, it is excluded from the South Eastern Company's route, and the wires are carried across the country, through Greenwich, Gravesend, Chatham, and Canterbury, the tubes being in the ground about two feet from the surface.

An expedition is about to be sent by the Geographical Society of St. Petersburg, to the Russian possessions in North America, and the dependent islands, to make scientific investigations. In addition to the sum awarded by the Society, two Russian noblemen, named Golubkon and Czapski, have severally given the munificent sums of 4,320*l.* and 4,032*l.*

Father Gavazzi is lecturing in Aberdeen, and other towns in the north of Scotland. The eloquent Italian has now acquired sufficient facility in speaking English to dispense with an interpreter, and to give a summary in English of his own orations. But his eloquence is as yet displayed only in his own language.

A complete collection of the military correspondence of Napoleon the Great is being formed by order of Napoleon the Little. Considerable progress has already been made in it, but it will, it is expected, take two years more to terminate. It is to be published, and will run to sixty or eighty volumes.

We must not omit a passing record of the death of one who, in a sense, might be called 'a man of letters,' the too famous Joseph Ady. Although always ready to inform others of 'something to their advantage,' he was unable to do much good for himself, and after a long life chiefly spent in his unprincipled yet amusing system of swindling, he died lately in distress and debt. Whether he had any relatives to mourn his loss we are not aware, but his departure will at least cause no pangs of regret to Sir Peter Laurie, or to the Postmaster-General.

The Exhibition of Irish National Industry at Cork closed last Saturday with a musical festival and promenade. The success of the undertaking has increased the sanguine zeal with which preparations are making for a great display at Dublin next season.

Antenor Joly, a French *littérateur* of some little note, and at one time director of the theatre in which one or two of the principal plays of Hugo were first performed, has just died of apoplexy at Paris.

The distinguished Humboldt has been seriously ill, but we are glad to learn from Berlin, that he has sufficiently recovered to resume his usual scientific avocations.

FINE ARTS.

THE ARCHITECTURAL STUDY AT CLAPHAM.

Clapham, September 8, 1852.

I HAVE read with much satisfaction your remarks on the ecclesiastical edifices lately erected at Clapham. As one resident in the neighbourhood, those structures have grown up under my daily observation, and I seem to have imbibed an involuntary studentship in speculative architecture with reference to the problem you at the same time suggest in respect of them. I therefore bear willing testimony to the interpretation you have given of their characteristic features being in æsthetic accordance with the denominations assembling at either of them. I would ask you, however, yet to widen the field of local observation you have suggested. I admit the prospect is not improved, neither is satisfaction the result of the experiment, for by that means the parish church on Clapham Common is brought within the scope of our criticism, and its positive ugliness, architecturally speaking, is the more manifest from the painful contrast with its efflorescent and more ambitious neighbours. I never look upon Clapham church without thinking of Cibber's description of a building devoted to less exalted purposes, "a plain brown brick house," and its portico, evidently a clumsy after-thought, thrust in much after the sample of the one attached to the building which

elicited the description of Cibber alluded to. Far is it from my intention in these remarks to stimulate the authorities of Clapham to join, at all events at the present time, in the architectural rivalries of the opposing sects in question, for I feel the true dignity of the English church is best consulted by preserving a calm and even course. Should, however, the spirit of *alteration* rise up amongst us hereafter, I trust she may be attended by her best handmaid, *improvement*; and though Clapham church was erected at a time when the worst possible taste prevailed in such matters, let us hope that so fine a site may not ever continue to be utterly sacrificed, but that we may yet see a fairer visible type of the Church of England erected, more artistically in unison with the exalted purposes to which it is dedicated, and more consonant with the emphatic injunction of Holy Writ, 'Let every thing be done decently and in order.'

J. W. B.

Winchester Cathedral. Drawn by Owen B. Carter, Architect; Lithographed by E. T. Dolby. Hogarth, Haymarket.

THIS is an architectural drawing of the choir of Winchester Cathedral, taken from a spot just beyond the western line of the transepts, looking due East. It has been printed in colours, and apparently heightened also by application of the brush afterwards. The drawing is evidently full and correct, and the architecture is in every portion distinctly traced. There is little, indeed, to call forth unusual skill, except it be the elaborate tracery of the canopied shrines which form the eastern screen. These are all of rich tabernacle work, and form a pleasing relief to the formal rectilinear style of the windows. The oak carvings, which are early in date, and red hangings of the choir, give a gorgeous, but rather heavy effect to the nearer part, and the pictorial merits would have been heightened by a little blending of the various tints. The light and shade has been nicely managed. The boxes, shields, and other ornaments of the roof would seem to have been recently repainted in their ancient colouring, but a little more of the blue curtain, which very judiciously shades the bishop's throne, would tone down the reds of the stalls, and improve the view, which we doubt not in this as in other matters, faithfully follows the original.

MUSIC.

TO our full report of the BIRMINGHAM MUSICAL FESTIVAL in last 'Gazette' we have little to add, except a brief notice of the later meetings. The concert on Thursday evening was remarkable for the successful performance of Beethoven's Choral Symphony (the ninth, in D minor), one of the greatest, and at the same time most difficult of his works. To bring forward such a composition at a miscellaneous concert was a bold attempt of Mr. Costa; but throughout the long time of its execution attention was sustained, and the best passages were received with manifest delight. The performance occupied the whole of the first part of the evening, a great variety of popular pieces being afterwards given, in some of which Tamberlik and Weiss, Mesdames Viardot Garcia, Castellan, Clara Novello, and Misses Williams, Dolby, and Zerr, especially pleased the audience. The restraint on applause and encores was not preserved at the evening as at the morning meetings. On Friday, Handel's *Samson*, an oratorio never very popular, gave less satisfaction than the great works of the other days. There are noble passages, however, in the oratorio, some of the choruses being equal to anything in epic music, and these were given with grand effect. There are also beautiful songs and duets, to which the principal singers did ample justice; but the whole performance passed off somewhat heavily, owing more to the tediousness of the recitative and unskilful arrangement of the oratorio itself, than to any fault in the performers. All the vocalists exerted themselves to the utmost, and generally with success. The air, 'Let the bright seraphim,' by Madame Novello, was repeated by

desire of the chairman, Lord Leigh, whose privilege of demanding encores was exercised with judicious rareness throughout the festival. On Friday evening the proceedings terminated with a full-dress ball, which was not numerously attended. M. Weippert's band was in efficient strength and order.

The following summary has been published of the comparative proceeds of the last three festivals:—

| | 1846. | 1849. | 1852. |
|-------------------|-----------------|-----------|------------|
| | £ s. d. | £ s. d. | £ s. d. |
| Tuesday Morning | 1489 15 5 | 1809 2 2 | 2304 0 7 |
| Tuesday Evening.. | No performance. | 453 16 0 | 439 7 0 |
| Wednesday Morn. | 1714 11 4 | 738 2 6 | 1649 0 5 |
| Wednesday Even. | 807 3 0 | 1378 13 0 | 869 0 0 |
| Thursday Morning | 2537 14 6 | 2514 5 4 | 2762 4 11 |
| Thursday Evening | 1349 6 0 | 811 4 0 | 1001 9 0 |
| Friday Morning .. | 2271 19 0 | 1256 13 1 | 1725 18 4 |
| | 10,170 9 3 | 8962 1 1 | 10,751 0 3 |

At the Birmingham Theatre, on Saturday evening, opportunity was afforded of some of the best vocalists being heard on the operatic stage, Grisi and Mario, and other performers not at the festival, also taking part. The last act of *Lucia di Lamermoor*, and the whole of *Lucrezia Borgia*, in the latter Grisi and Mario, and in the former Castellan and Tamberlik, appeared in more than usual force.

The London musical entertainments at this moment are of the most miscellaneous kind. At the St. James's Theatre we have the 'Tyrolean Singers'; at the Cyclorama the 'Hungarian Musicians'; under the direction of M. Kalozdy; at the Strand Theatre 'a black opera troupe,' and 'Mr. Baptist Panormo, the pianist'; while Henry Russell at the Lyceum has been pleasing crowded audiences with his spirited or plaintive songs. At the Surrey Gardens, and other *al fresco* places of amusement, the last notes of vocal or orchestral music are dying away as the autumnal evenings, darker and chiller, close in.

M. Reber's new three-act opera, *Le Père Gailard*, just produced at the Opéra Comique at Paris, is a work of very considerable merit, and has obtained decided success. It displays none of that unworthy pandering to the vulgar taste for noise, which is the fault of many composers, but is throughout chastened and severe. There is, too, a vein of melancholy in it, which is not often to be found in French works, and which is truly charming. The *morceaux* with which it is studded are of considerable beauty, and several of them of marked originality. To describe it in one word—it is said by eminent critics to be worthy of Boieldieu. The *libretto* is by M. Sauvage. It is not remarkably brilliant. The plot is the hackneyed one of a child being confided to a worthy woman to take care of; of the husband being made to suspect that it is hers, born before marriage, and that consequently he is deceived as to her virtue; and of the mystery being satisfactorily cleared up after a due amount of difficulties. It is more moral, more *bourgeois*, than the general run of comic operas, but is none the worse for that. It is capably sung by Mlles. Decroix and Meyer, and by Bataille and Sainte-Foy.

At the Grand Opéra, Roger and Massol have resumed their duties; they made their *rentrée* in the *Juif Errant*.

THE DRAMA.

We have refrained from mentioning the revival of *Jack Sheppard*—*Jack*, Mrs. Keeley—at THE HAYMARKET, on the principle that the less publicity given to such announcements the better. But we cannot help stating a fact which too sadly confirms the fears theoretically entertained of the directly mischievous results of exhibiting vice on the stage, invested with an appearance of romance and heroism. We learn from one of Her Majesty's inspectors of prisons, that several criminals have related to him how their first acts of crime were the result of witnessing the performance of this play. Surely managers and actors, in the course

of their professional life, might allow a little of that spirit to influence them which is so nobly expressed regarding the works of a poet who had never willingly encouraged vice, nor written a line which, "dying, he should wish to blot." But if love of gain (in which, however, we hear there has been a disappointment) silences all other considerations in those who continue the nuisance, the Lord Chamberlain ought to interfere. If the licence for this play has been withdrawn from lesser theatres on the ground of morality, we do not see why it should be tolerated in one whose boards are chiefly renowned for the legitimate drama—a house neither in its character nor in its prices so high as to render it unlikely to be attended by the classes on whom such performances have most influence. We say this as much for the credit of the English stage as for the good of society, on both of which grounds we make this protest of strong and general condemnation. The drama in England has at present enough of opposition to face without exciting just hostility by the direct encouragement of crime.

THE AMATEUR COMPANY of the Guild of Literature and Art have now finished their dramatic performances, and have advertised for sale their theatre, with the scenery, dresses, and all things appertaining to it. We have heard more than one strange rumour as to the cause of this sudden break up of the company, but the simple fact is, that the performers began to tire of work involving no little sacrifice of time, and as a goodly sum has been now collected, the company do not feel called upon to continue labours hitherto most heartily contributed to the cause. The sacrifices made by these gentlemen, especially of time so precious to men engaged in active literary and artistic pursuits, is duly appreciated by the public, and gratefully acknowledged by the friends of the institution for the benefit of which they acted. We hope that the theatre and its furniture now advertised for sale may fall into worthy hands, and, perhaps, still be occasionally used for purposes of benevolent charity as well as of amusement. The price asked, we believe, is 350*l.*, to be added to the funds of the Guild.

The American papers report the death, rather suddenly, from inflammation and fever, of our actress, Miss Laura Addison, who had just appeared successfully at the Broadway Theatre. Mr. Thompson of the Manchester Theatre, a comedian of good promise, died lately, also suddenly.

M. de Lamartine has, we hear, written a new tragedy, and he will, it is said, give it to the Odéon Theatre.

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(PROPRIETARY.)

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|------|--|---|
| Yrs. | Mths. | £ s. d. |
| 25 | 0 | 19 7 1 |
| 30 | 1 | 1 9 2 |
| 35 | 1 | 4 11 2 |
| 40 | 1 | 9 2 2 |
| 45 | 1 | 14 10 3 |
| 50 | 2 | 2 6 4 |
| 55 | 2 | 12 9 5 |
| 60 | 3 | 6 8 6 |

(MUTUAL.)

Extract from Table with Participation in Profits, after Seven Yearly Payments.

| Age. | Annual Premium. | Half-Yearly Premium. | Quarterly Premium. |
|------|-----------------|----------------------|--------------------|
| Yrs. | Mths. | £ s. d. | £ s. d. |
| 30 | 0 | 2 7 3 | 1 4 2 |
| 35 | 1 | 2 7 6 | 1 4 4 |
| 40 | 1 | 2 7 10 | 1 4 6 |
| 45 | 1 | 2 8 2 | 1 4 8 |
| 50 | 3 | 3 3 0 | 1 12 3 |
| 55 | 3 | 3 3 6 | 1 12 6 |
| 60 | 3 | 3 4 1 | 1 12 10 |
| | 9 | 3 4 7 | 1 13 1 |

E. R. FOSTER, Resident Director.

ANDREW FRANCIS, Secretary.

BARON LIEBIG on PALE ALES.—If I wished

to associate with any individual brewery my remarks on the alleged adulteration of bitter beer with strychnine, it would have been only natural to have mentioned another brewery, in which alone, and not in Mr. Allsopp's, I was engaged in investigating the Burton mode of brewing, and it was also in that brewery, and not in Mr. Allsopp's, that the Bavarian brewers acquired all the instructions they obtained—at Burton. The admiration I expressed of this beverage, in my letter to Mr. Allsopp, is advertised in such a manner as to lead to the inference that my praise was exclusively confined to Mr. Allsopp's beer; this was not the case; my remarks referred to that class of beer.

Glessen, July 24, 1852. JUSTUS LIEBIG.
N.B.—The Baron's original letter is in the hands of Mr. Miller, at the Jerusalem Coffee-House, Cornhill, where it may be seen by any one taking an interest in the matter.

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Gardeners' Chronicle.

To all those who desire to judge scientifically of what is possible in the cultivation of the Indo-Alpine Flora, which is now so rapidly enriching our gardens, works of this description have great interest. Unlike gossiping books of travels, such as are the favourite reading of circulating libraries and book clubs, to be perused at a glance and forgotten in an hour, the record of researches such as Dr. Thomson's forms a subject of serious reference, which can only lose its value when men cease to regard physical facts as the foundation of all true knowledge.

Although it is sufficiently obvious that Dr. Thomson's work was not written for the readers of the *Atlas*, yet, since it is the fashion for every little paper to have its 'Library Table,' it is well to show occasionally, for the honour of criticism, how utterly ignorant of sound literature are many of those who profess to review books. With some a book has little chance of being received with favour, unless accompanied by a five-shilling advertisement. In the present instance the son of our late venerable father of chemistry, who from being tutored to scientific habits of observation, was selected by the Governor-General of India to explore the physical features of Western Himalaya and Tibet, is treated as a charlatan; and discredit is sought to be thrown upon his narrative—first, because the important bearings of his researches are not understood; and secondly, because they are not interlarded with personal details and tittle-tattle, suitable for newspaper reading.

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Table I. exhibits the necessary Premiums for the Assurance of £100 on a Single Life.

| Age. | For One Year. | For Seven Years. | Annual Premium for the whole of Life, without Profits. | Annual Premium for the whole of Life, with Profits. |
|------|-------------------|-------------------|--|---|
| 15 | £ s. d. 0 14 9 | £ s. d. 0 16 6 | £ s. d. 1 9 10 | £ s. d. 1 15 2 |
| 20 | 0 17 7 | 0 19 7 | 1 13 11 | 1 19 6 |
| 25 | 1 1 1 | 1 3 0 | 1 18 7 | 2 4 3 |
| 30 | 1 4 4 | 1 6 7 | 2 3 11 | 2 9 9 |
| 35 | 1 8 2 | 1 10 6 | 2 10 6 | 3 4 5 |
| 40 | 1 12 0 | 1 14 2 | 2 18 3 | 3 15 7 |
| 45 | 1 15 9 | 2 0 5 | 3 9 3 | 4 9 9 |
| 50 | 2 4 6 | 2 10 4 | 4 3 3 | 5 7 6 |
| 55 | 2 15 1 | 3 3 4 | 5 0 10 | 6 12 6 |
| 60 | 3 11 0 | 4 5 11 | 6 5 6 | |

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